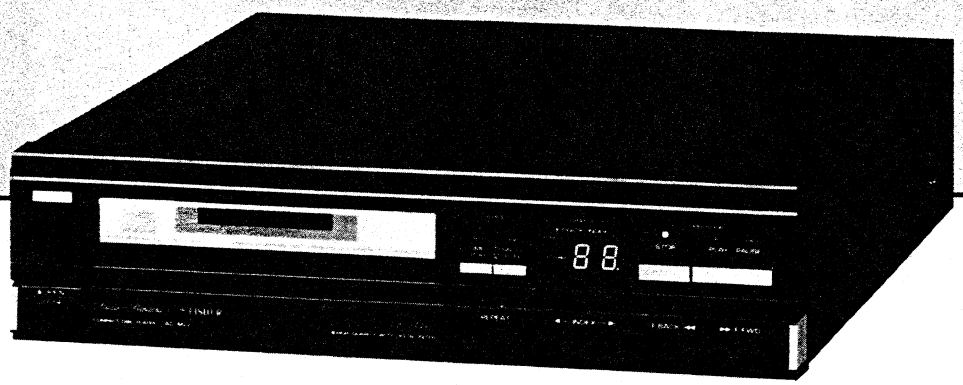
SERVICE MANUAL

FISHER

AD-M22

Digital Compact Disc Player

(EUROPE)



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WM-15423

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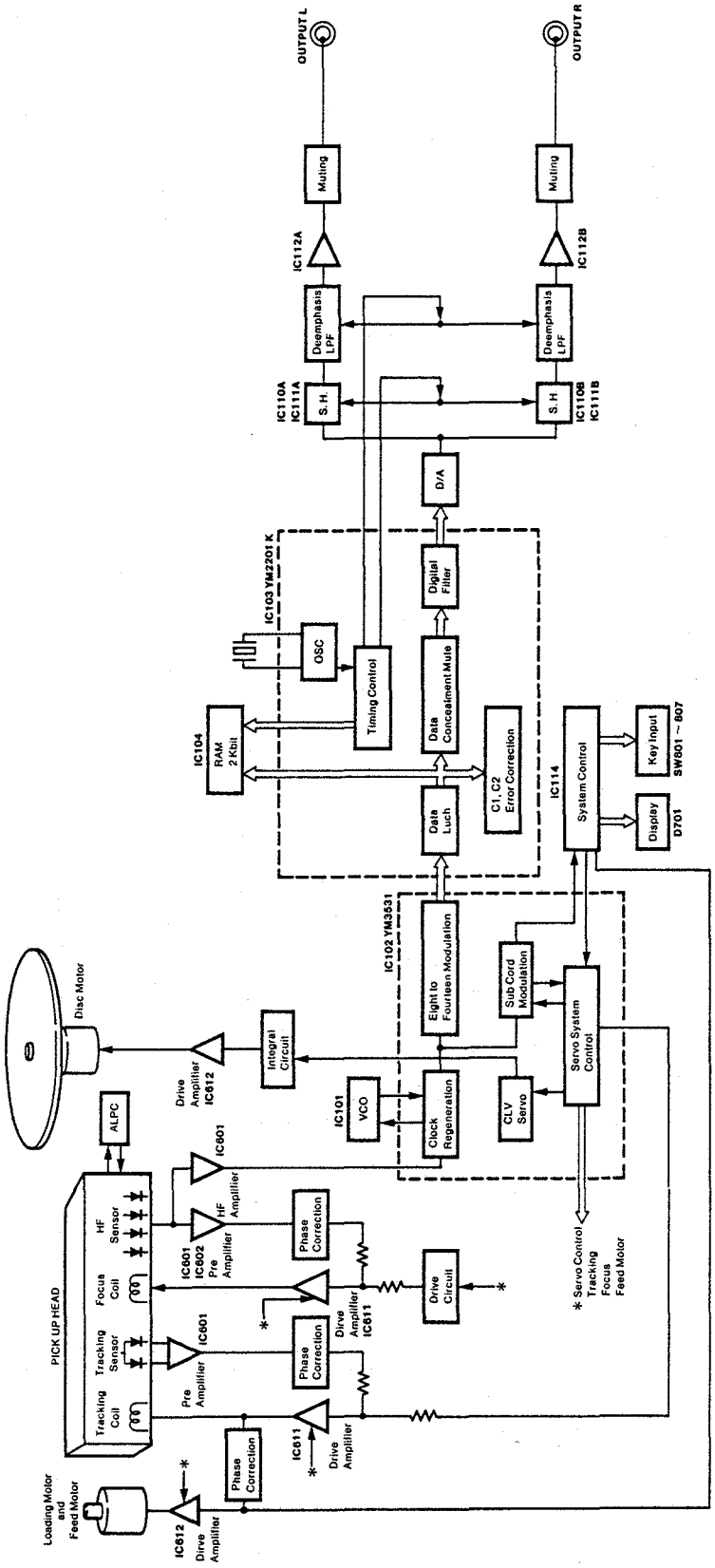
SPECIFICATIONS

DIGITAL COMPACT DISC PLAYER	AD-M22
System	Compact disc digital audio system
AUDIO CHARACTERISTICS Frequency Response	5 Hz – 20 kHz, ±0.5 dB
Harmonic Distortion	Less than 0.03 % (1 kHz)
S/N Ratio	More than 90 dB
Wow and Flutter	Unmeasurable
Channel Separation	More than 80 dB (1 kHz)
Output Voltage max.	2 Vrms
FUNCTIONS Instant Selection	Sequential, with F-FWD and F-BACK buttons
Instant Index	Sequential, with INDEX ▶I and INDEX I◀ buttons
Repeat	All selections or one selection
Reset	Press STOP button twice
Pause	Each selection
Disc Loading	Motor driven horizontal loading
DIGITAL SIGNAL PROCESSING Optical Pickup	3-beam laser
Error Correction	CIRC
Sampling Frequency	44.1 kHz
D/A Conversion	16-bit linear
Filter	Digital filter + (2-pole CR filter)
GENERAL Power Requirements (50/60 Hz)	AC 110/220 V 20 Watts
Dimensions (WxHxD)	335 x 85 x 340 mm
Weight (approx.)	3.8 kg

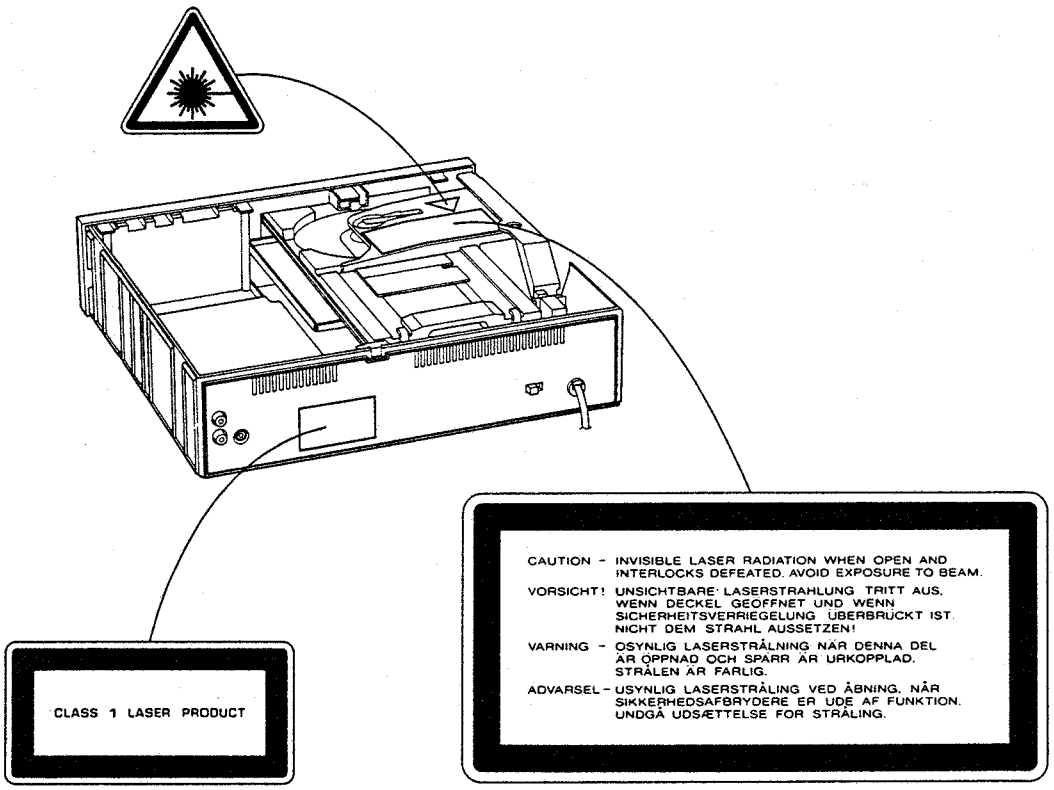
Because its products are subject to continuous improvement, Fisher Corporation reserves the right to modify product designs and specifications without notice and without incurring any obligation.

FUNCTIONAL BLOCK DIAGRAM



SAFETY CERTIFICATION

SICHERHEITSBESTIMMUNGEN / CERTIFICAT DE SÉCURITÉ / SAFETY CERTIFICATION
SÄKERHETSFÖRESKRIFTER / VEILIGHEIDSCERTIFIKAAT


CLASS 1 LASER PRODUCT
CAUTION - INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
VORSICHT! UNSICHTBARE LASERSTRAHLUNG TRITT AUS, WENN DECKEL GEOFFNET UND WENN SICHERHEITSVERRIEGELUNG UBERBRUCKT IST. NICHT DEM STRAHL AUSSETZEN!
VARNING - OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRR ÄR URKOPPLAD. STRÅLEN ÄR FARLIG.
ADVARSEL - USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.

ACHTUNG – WENN ANDERE ALS DIE HIER BESCHRIEBENEN BEDIENUNGS- ODER JUSTIEREINRICHTUNGEN BENÜTZT ODER ANDERE ARBEITEN AUSGEFÜHRT WERDEN, KANN DIES ZU GEFÄHRLICHER STRAHLUNGSEINWIRKUNG FÜHREN.

ATTENTION – L'EMPLOI D'ORGANES DE COMMANDE OU DE RÉGLAGE, OU L'EXÉCUTION DE PROCÉDURES, AUTRES QUE CEUX SPÉCIFIÉS DANS LE MODE D'EMPLOI, PEUT PROVOQUER UNE EXPOSITION DANGEREUSE AU RAYONNEMENT.

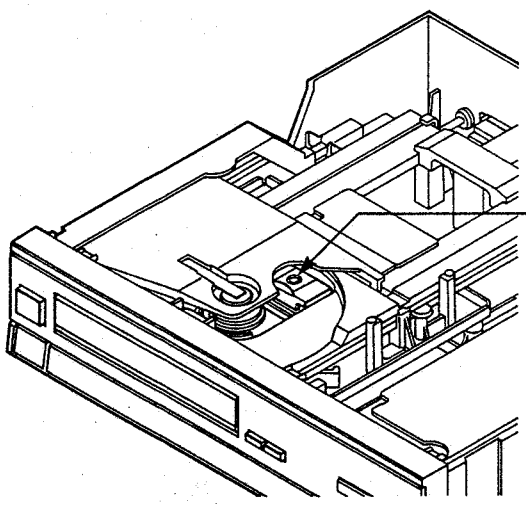
CAUTION – USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

VARNING – BRUK AV KONTROLLER, JUSTERINGAR ELLER MANÖVRERING AV APPARATEN PÅ ANNAT SÄTT ÄN VAD SOM HÄR ANGIVS KAN INNEBÄRA STRÅLNINGSRISK.

OPGELET – HET GEBRUIK VAN REGELAARS OF HET MAKEN VAN AFSTELLINGEN E.D. DIE NIET IN DEZE GEBRUIKSAANWIJZING ZIJN BESCHREVEN KAN LEIDEN TOT SCHADELIJKE STRALINGEN.

CAUTELA – L'USO DI COMANDI, AGGIUSTAMENTI O PROCEDIMENTI DIVERSO DA QUELLO QUI SPECIFICATO PUÒ DAR LUOGO AD ESPOSIZIONE A RADIAZIONI PERICOLOSE.

LASER BEAM RADIATION SPOT

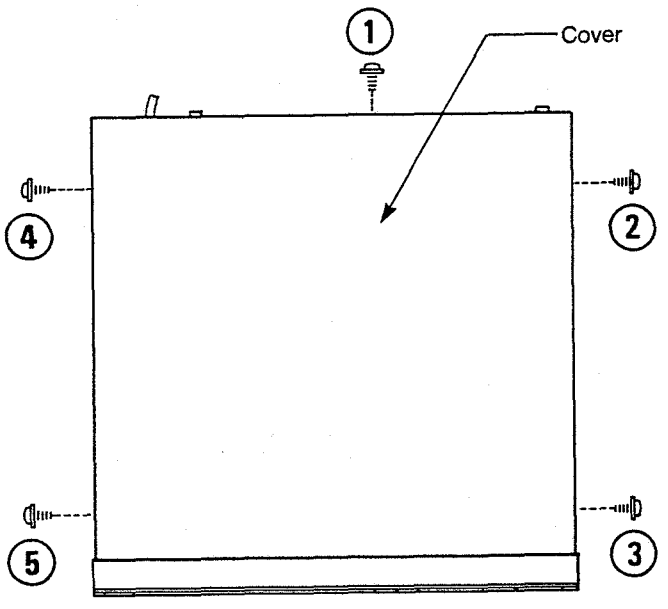


Laser Diode Properties
Material : Ga-Al-As
Wavelength : 755 – 815 nm (25°C)
Laser Output : Continuous Wave max. 0.5 mW

DISASSEMBLY INSTRUCTIONS

REMOVING COVER

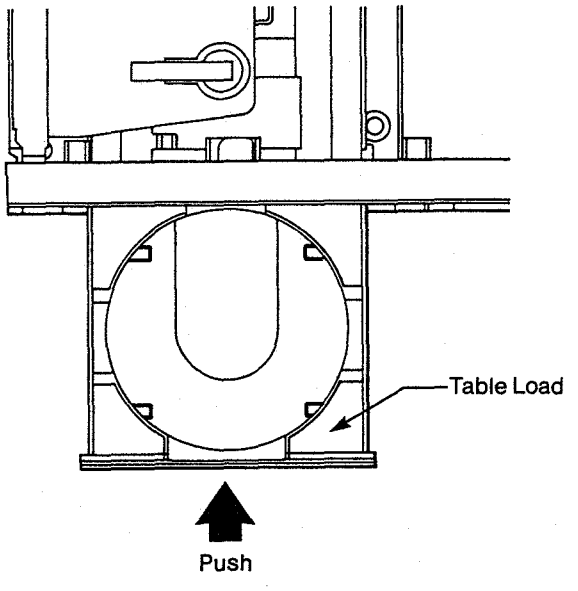
1. Lift and disassemble the cover by removing the five mounting screws on the cover. (No. 1 ~ 5)



REMOVING TABLE LOAD

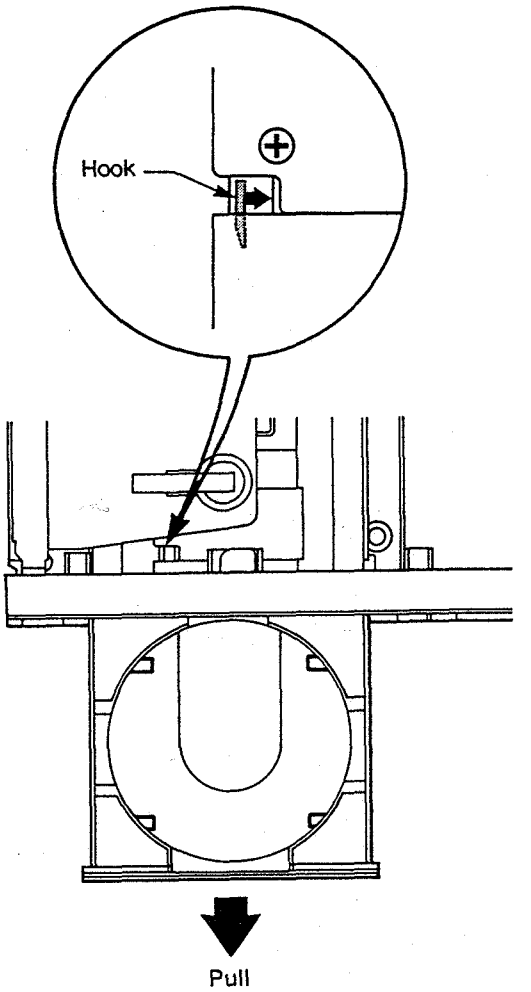
1. After removing the cover, switch on the power and open the table load by pressing the OPEN/CLOSE button.

2. With the table load being opened, switch off the power and push the table load with your hand to close it.



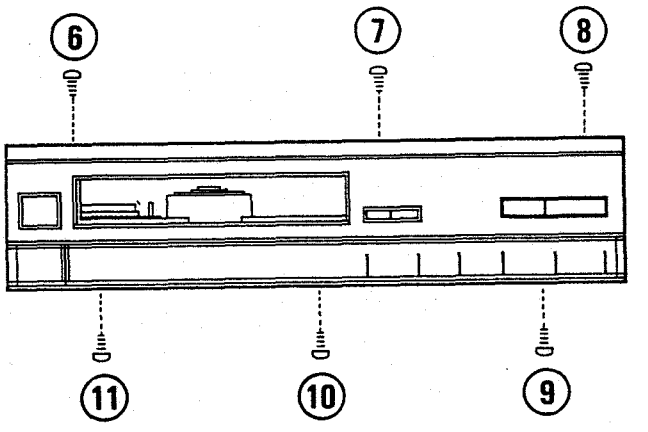
3. Slide out the closed table load with your hand to open it again. It can be pulled out smoothly as it gets out of gear at this time.

4. Sliding out the table load, pull it out by moving the hook in the direction of the arrow.



REMOVING FRONT PANEL

1. After removing the table load, disassemble the front panel by removing six mounting screws on the front panel. (No. 6 ~ 11)

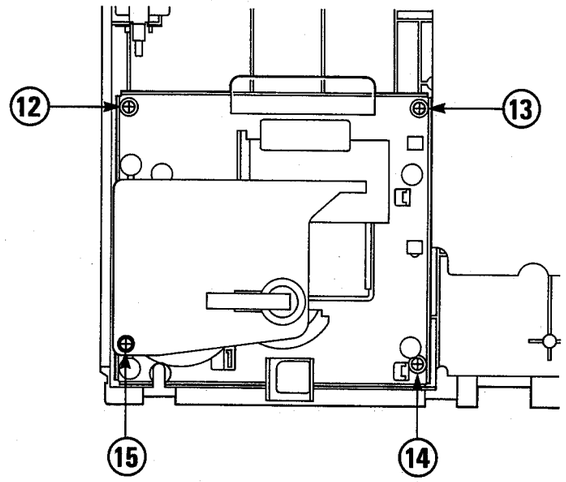


DISASSEMBLY INSTRUCTIONS (Continued)

REMOVING MECHANICAL ASSEMBLY

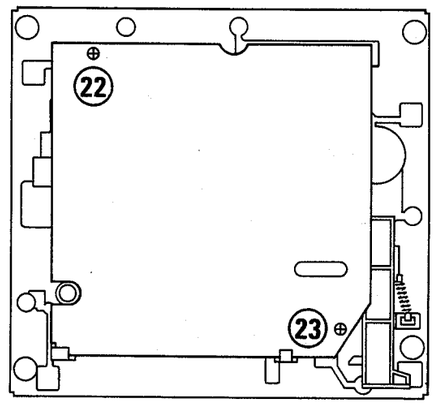
1. After removing the front panel, disassemble the shaft of the power switch.

2. Disassemble the mechanical assembly by removing the four mounting screws fixing it. (No. 12 ~ 15)



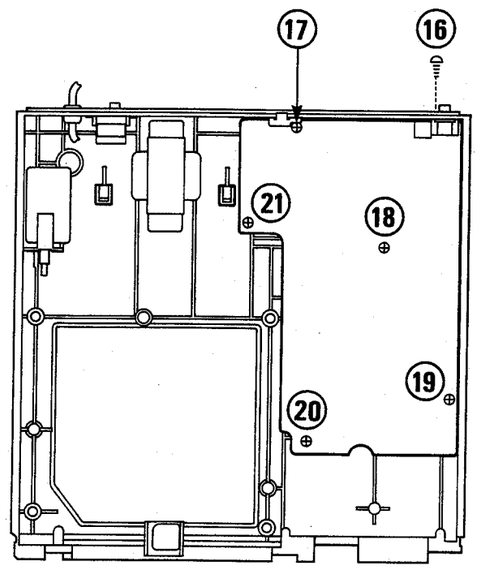
REMOVING SERVO P.C.BOARD

1. After removing the mechanical assembly, disassemble the Servo P.C.Board by removing the two mounting screws. (No. 22, 23) If necessary, unsolder the leads.



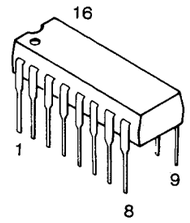
REMOVING MAIN P.C.BOARD

1. After removing the mechanical assembly, disassemble the Main P.C.Board by removing the six mounting screws fixing it. (No. 16 ~ 21)

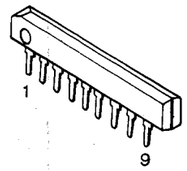


SEMICONDUCTOR LEAD IDENTIFICATION

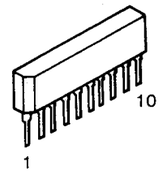
INTEGRATED CIRCUITS



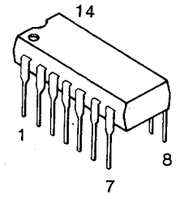
- LC 4050 B
- MSM 4053 RS



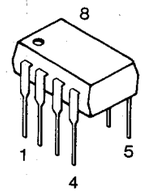
- NJM 2043 S
- NJM 4558 S
- TA 75393 S



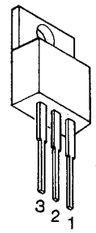
- STA 451 C



- TC 40H 004 P
- TC 74HC 08
- TC 74HC 32

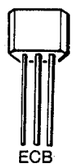


- LM 833 N
- NJM 4558 DX



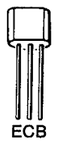
- L 78M05

TRANSISTORS

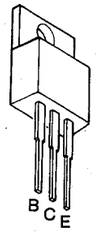


- 2SA 1345
- 2SC 3400
- 2SD 1012

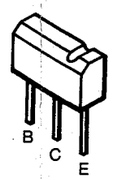
- 2SD 612



- 2SA 608
- 2SB 698
- 2SC 536
- 2SD 734

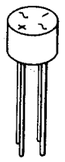


- 2SB 511

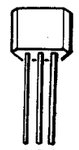


- DTA 114 TF

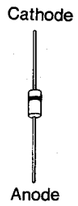
DIODES



- W02

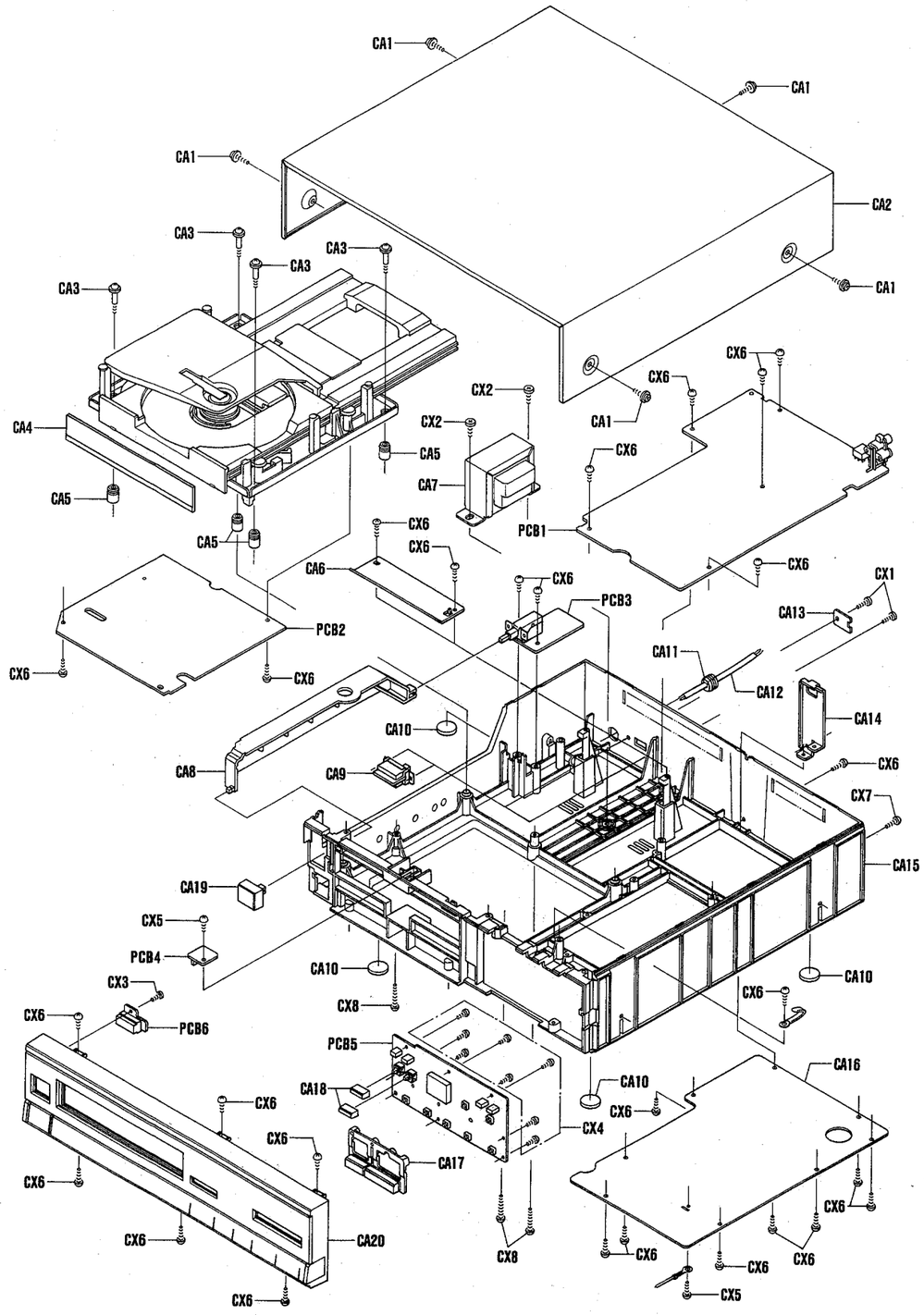


- SVC 211



- DS 442
- GMA 01
- GZA 8.2 Y
- GZA 13 Y

CABINET & CHASSIS EXPLODED VIEW



CABINET & CHASSIS PARTS LIST

Ref. No.	Part No.	Description	Q'ty
	PACKAGE		
	131-6-1169-17201	Box Corrugate-exp	1
	131-6-3009-35840	Pad Rear	1
	131-6-3009-35850	Pad Front	1
	131-6-3069-16350	Patching Sheet	1
	141-6-2519-22290	Sheet Polyethylene	1
	141-6-4559-03300	Serial No. Sheet	2
	ACCESSORIES		
	4-2369-74031	Plug Cord	1
	4-2369-74130	Plug Cord	1
	131-6-2719-10401	Bag Fan	1
	141-6-4159-00622	Notes	1
	142-6-4119-32676	Explantory Booklet	1
	CABINET		
	4-2359-78414	Connector 1P Assy	1
	131-2-1310-40504	Name Plate (Rating)	1
	131-2-7103-50700	Label (Caution)	1
	131-6-4159-40200	Notes (Laser)	1
	131-6-4159-40300	Notes (Laser)	1
	131-6-4159-39600	Notes (Laser)	1
	131-6-4559-10900	Manufacturing No.	1
	141-2-2449-55200	Sheet	1
	141-2-2449-55200	Sheet	1
	141-2-2899-49400	Adhesive Sheet	1
	141-2-4729-04200	Lug	1
	141-2-4729-07100	Wire Band	11
CA1	141-2-4219-33101	Screw, Bind Hd. Tapping-B, +M3.0x8	5
CA2	131-2-1410-33600	Cover	1
CA3	134-2-4106-27000	Shaft	4
CA4	131-2-1407-13900	Cover Decorate	1
CA5	131-2-5205-32700	Cushion Rubber	4
CA6	131-2-3108-13100	Metal Stopper	1
CA7	⚠ 4-2512-31020	Power Trans [T1]	1
CA8	131-2-4219-20000	Shaft	1
CA9	⚠ 4-2312-01020	Switch Slide (Voltage Selector) [SW104]	1
CA10	131-2-1801-16200	Leg	4
CA11	141-2-3899-10400	Bushing	1
CA12	⚠ 4-2432-00500	Power Cord	1
CA13	131-2-7104-00500	Plate Pad Switch	1
CA14	131-2-3101-99800	Metal Mount Cover	1
CA15	131-2-3301-31701	Chassis Main	1
CA16	131-2-1105-31301	Plate Bottom	1
CA17	131-0-1001-63900	Knob Touch Assy	1
CA18	131-2-1601-94100	Knob (Push)	2
CA19	131-2-1601-94200	Knob Power	1
CA20	131-0-1015-11401	Escutcheon Dial Assy	1
CX1	101-3-1303-00818	Screw, Pan Hd., +M3.0x8	2
CX2	103-3-1704-01011	Screw, Bind Hd. Tapping-2, +M4.0x10	2
CX3	143-3-1702-00611	Screw, Bind Hd. Tapping-B, +M2.0x6	1
CX4	143-3-1902-60611	Screw, Braz. Hd. Tapp.-B, +M2.6x6	8
CX5	143-3-1903-00611	Screw, Braz. Hd. Tapp.-B, +M3.0x6	2
CX6	143-3-1903-00818	Screw, Braz. Hd. Tapp.-B, +M3.0x8	27
CX7	143-3-1903-01018	Screw, Braz. Hd. Tapp.-B, +M3.0x10	1
CX8	143-3-1903-02011	Screw, Braz. Hd. Tapp.-B, +M3.0x20	3
PCB1	141-0-1939-08265	Main P.C.B. Assy	1
PCB2	141-0-1939-08270	Servo P.C.B. Assy	1
PCB3	141-0-1939-08294	Power Switch P.C.B. Assy	1
PCB4	141-0-1939-08320	Disk Indicator P.C.B. Assy	1
PCB5	141-0-1939-12280	Control P.C.B. Assy	1
PCB6	141-0-1939-12350	Power Indicator P.C.B. Assy	1

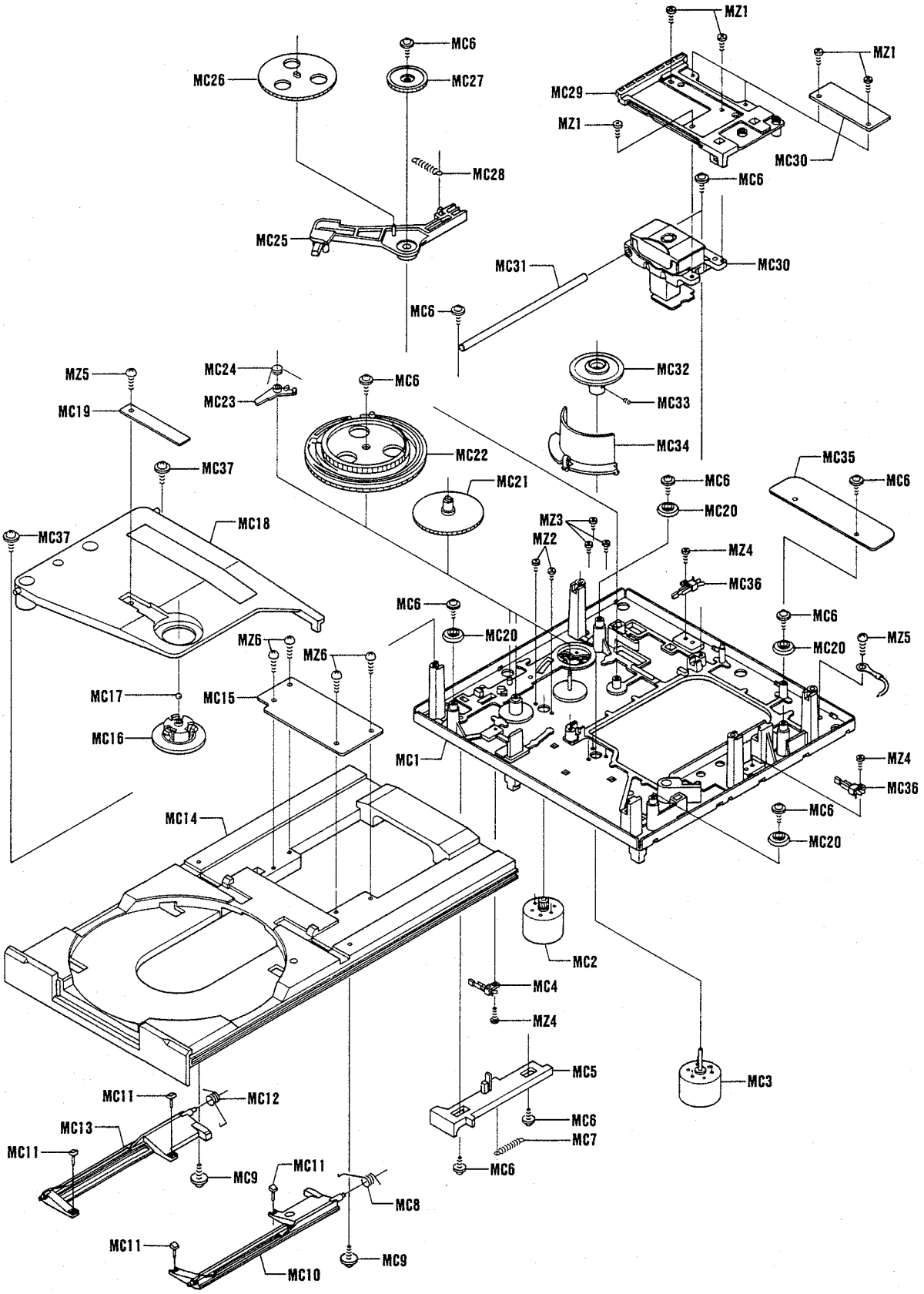
NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

MECHANISM EXPLODED VIEW



MECHANISM PARTS LIST

Ref. No.	Part No.	Description	Q'ty
	MECHANISM		
MC1	141-0-3119-24600	Chassis Assy	1
MC2	141-0-5519-11500	Gear Motor Assy [M101]	1
MC3	4-5279-71420	Motor (Spindle) [M102]	1
MC4	4-2319-74170	Leaf Switch (Eject) [SW101]	1
MC5	141-2-7319-64500	Slide Eject	1
MC6	141-2-4219-05400	Screw Washer	11
MC7	141-2-8549-27700	Spring Slide Eject	1
MC8	141-2-8529-23700	Spring Lever Right	1
MC9	131-2-4201-28201	Screw	2
MC10	141-2-7419-94500	Lever Hold Disk Right	1
MC11	141-2-4459-36000	Pad Disk	4
MC12	141-2-8529-23800	Spring Lever Left	1
MC13	141-2-7419-94600	Lever Hold Disk Left	1
MC14	141-2-1149-40102	Table Load	1
MC15	141-2-3519-73900	Plate Reinf.	1
MC16	141-2-3519-72400	Holder Disk	1
MC17	141-2-8259-04800	Ball	1
MC18	141-2-6229-01400	Flap Disk Cramp	1
MC19	141-2-8539-53700	Spring Plate	1
MC20	141-2-8259-12600	Roller Table Load	4
MC21	141-2-5519-59900	Gear Load	1
MC22	141-2-5519-60000	Gear Cam	1
MC23	141-2-7419-94300	Lever Stop	1
MC24	141-2-8529-23900	Spring Lever Stop	1
MC25	141-0-7419-42400	Lever Rock Assy	1
MC26	141-2-5519-59800	Gear Pick-up	1
MC27	141-2-5519-59700	Gear Pinion	1
MC28	141-2-8549-27800	Spring Lever Rock	1
MC29	141-0-7319-29400	Slide Base Pick-up Assy	1
MC30	134-0-4009-04000	Pick-up Assy	1
MC31	141-2-7519-72100	Shaft Pick-up	1
MC32	141-2-5229-00600	Turntable	1
MC33	141-2-4219-36700	Set Screw, V-cone, M2.0x4	1
MC34	141-2-2419-31300	Shelter Turntable	1
MC35	141-2-8219-36000	Stopper Lead	1
MC36	4-2319-75281	Leaf Switch (Pick-up Limit) [SW102]	1
MC36	4-2319-75281	Leaf Switch (Loading Limit) [SW103]	1
MC37	131-2-4201-28300	Screw	2
MZ1	101-3-1702-60411	Screw, Bind Hd., +M2.6x4	5
MZ2	128-3-1317-02013	PI Screw-3, Pan Hd., +M1.7x2.0	2
MZ3	128-3-1317-02518	PI Screw-3, Pan Hd., +M1.7x2.5	3
MZ4	143-3-1702-00611	Screw, Bind Hd. Tapping-B, +M2.0x6	3
MZ5	143-3-1903-00618	Screw, Braz. Hd. Tapp.-B, +M3.0x6	2
MZ6	143-3-1903-00818	Screw, Braz. Hd. Tapp.-B, +M3.0x8	4

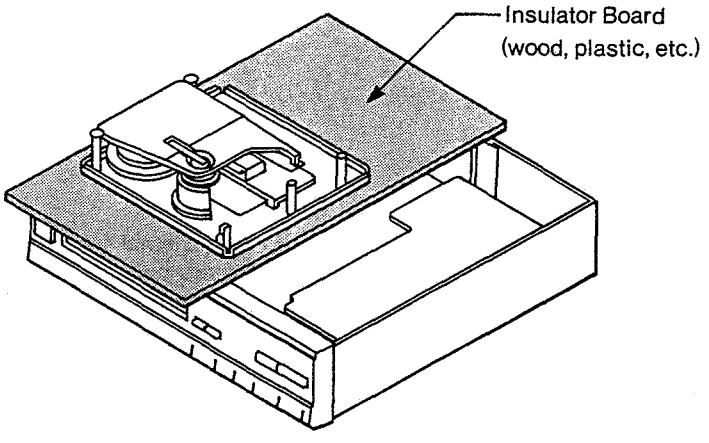
NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

ADJUSTMENT PROCEDURES

BEFORE STARTING ADJUSTMENTS

- Make adjustments in the order of the item numbers. When a certain item has been adjusted, make all the adjustments following that item.
- When making the adjustment, refer to the disassembly procedure. Remove the mechanism, place an insulator board in the chassis, and it is convenient to place the mechanism on top of this. (Leave the wires connected.)



- Concerning the test points and adjustment volume shown in the adjustment items, refer to the P.C.Board Alignment Points.

REQUIRED EQUIPMENTS

- DC voltmeter
- Dualtrace oscilloscope
- Frequency counter
- Low-frequency oscillator
- Laser power meter
- Plastic screwdriver
- Diffraction grating adjustment jig
- Test disc (Sony: YEDS7, Sony: YEDS4)

1. CONFIRMING LASER OUTPUT

1. Short between **F2** and **H1**, the test points of the Main P.C.Board.
2. Make the laser output section visible by removing the flap disc clamp.
3. Switch on the power and press the PLAY/PAUSE button once to get the laser output continuously. Applying the laser sensor of the laser power meter to the emitter, make sure that the output is in the range of 0.25mW and 0.5mW.
4. Reinstall the flap disc clamp and repair the short between **F2** and **H1**.

2. PLL FREE RUN

1. Introduce 10kΩ of a resistance between **HF** and **GND**, test points of the Main P.C.Board.
2. Connect the frequency counter to between **CK** and **GND** of the test points of the Main P.C.Board by using a probe.
3. Adjust the generation coil L101 with a plastic screwdriver for getting a indication in the range of 4.320MHz and 4.330MHz on the frequency counter.
4. Remove the resistance between **HF** and **GND**.

3. TENTATIVE SETTING OF VOLUME

1. Set the semi-fixed resistance tentatively as follows:

VR601 (FOCUS OFFSET)	Center Position
VR602 (FOCUS GAIN)	Center Position
VR603 (E-F BALANCE)	Center Position
VR604 (TRACKING OFFSET)	Center Position
VR605 (TRACKING GAIN)	Turn to the end counter-clockwise.
VR606 (KICK GAIN)	Center Position

4. FOCUS OFFSET ADJUSTMENT

1. Turn on the power and keep it in the state of "STOP".
2. Connect a DC voltmeter to the focus error test terminal and adjust the VR601 to make DC voltage in the range of 0V ±10mV.

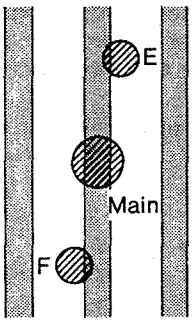
5. TRACKING OFFSET ADJUSTMENT

1. Turn on the power and keep it in the state of "STOP".
2. Connect a DC voltmeter to the tracking error test terminal and adjust the VR604 to make DC voltage in the range of 0V ±10mV.

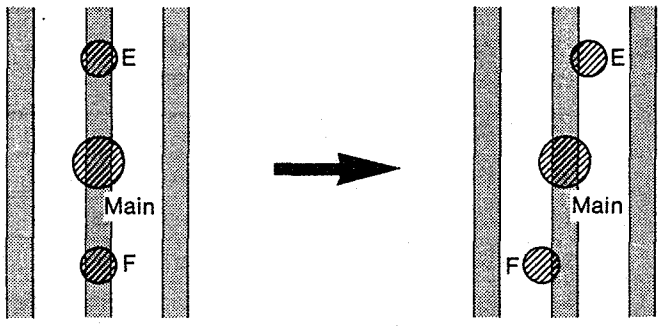
ADJUSTMENT PROCEDURES (Continued)

6. GRATING ADJUSTMENT

1. This player adopts the 3-beam method for its optical pickup. The grating adjustment is made by adjusting the relative location of the E-beam and the F-beam to the main beam on a bit line as shown in the following figure.

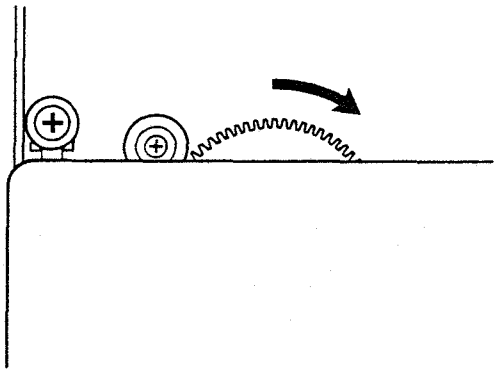


For adjustment, arrange them in a line at first, then, adjust them for the specified location.

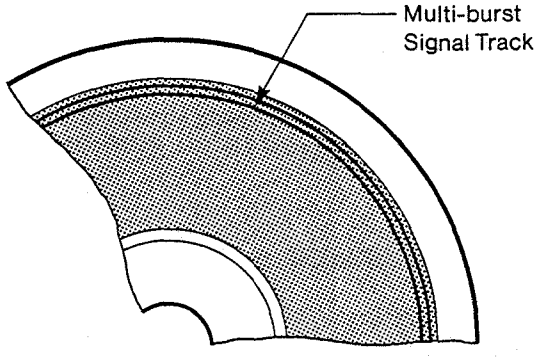


The procedures of this adjustment are as follows. Adjust with care as they are fine tuning.

1. Make sure that the VR605 is turned counterclockwise to the end.
2. Loading the test disc YEDS7 on the turntable, short between the test points, **H1** and **F2**, of the main board.
3. Connect the each channel of the dualtrace oscilloscope to the each pin of No. 10 and No. 12 on the IC601 of E/F output.
4. Switching on the power, make sure that the disc stops after several minutes of rotation. Then, keep the PLAY/PAUSE button pressed until the disc restarts to rotate.
5. When the disc starts to rotate, an waveform can be observed on the oscilloscope. With observing the waveform, turn the gear little by little with your hand in the direction of the arrow to send the pickup outward.

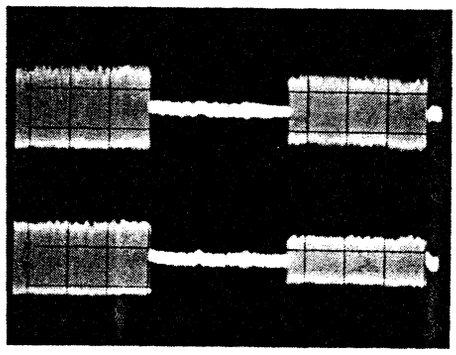


6. When the pickup comes close to the external track, the waveform on the oscilloscope disappears once, and then appears again. This is the place showing the track for a multi-burst signal.

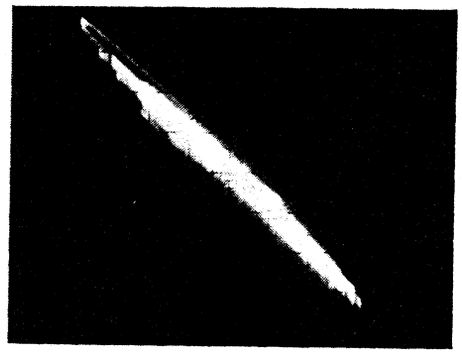


7. When the pickup comes in the track for a multi-burst signal, turn the VR605 to the center point and command the tracking servomechanism. At this time, if the burst signals of the E-beam and the F-beam are synchronous, the two beams are on the same bit line. And if they are not synchronous each other, they are not on the same bit line.

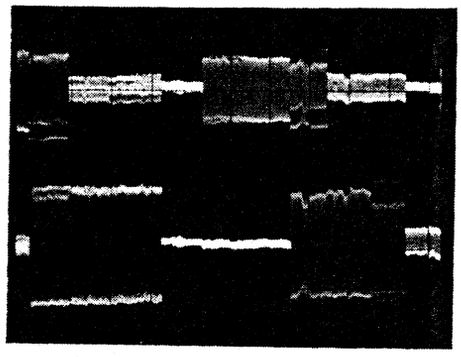
ADJUSTMENT PROCEDURES (Continued)



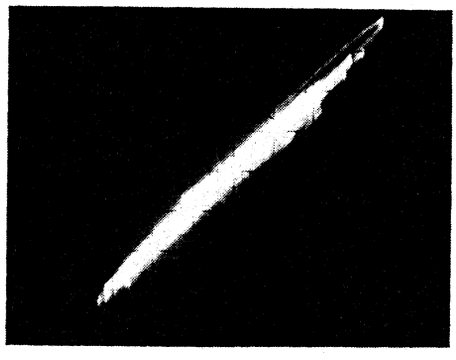
The two beams are on the same bit line.
(50mV/DIV : 5mSec/DIV)



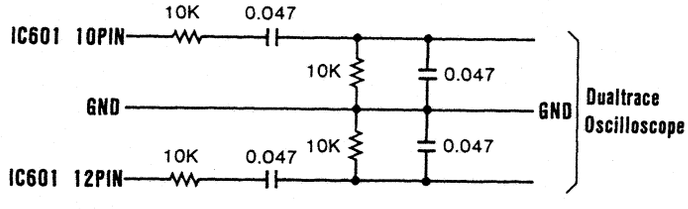
In the above item 7, if the three beams were not in one bit line, put the jig into the adjusting hole and turn it to the left or to the right. When the waveforms form almost one line without a phase difference as shown in the figure, you can know the beams are in a line.



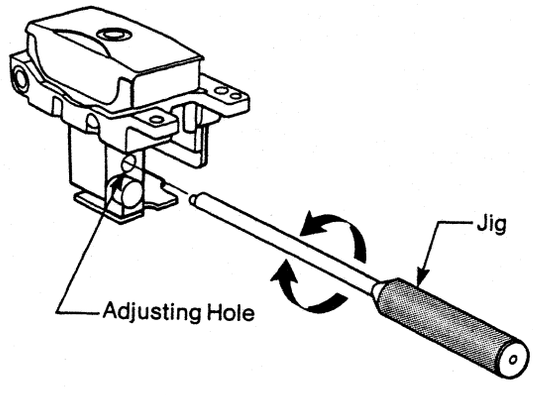
The two beams are not on the same bit line.
(50mV/DIV : 5mSec/DIV)



8. In this state, connect the following band-pass filters between; each of No. 10/No. 12 pins and the oscilloscope for observing the Lissajous's waveforms.



9. In the case that the three beams are on the same bit line with showing the waveforms are almost in a line by a phase difference of 180°, it means the grating has been adjusted. If required, adjust it by putting an adjusting jig into the hole for adjusting grating.



In this state, turn the jig clockwise to make the phase difference 180° with keeping the waveform in a line.

ADJUSTMENT PROCEDURES (Continued)

10. After completing the adjustment in the item 9, make sure that the E-beam and the F-beam are on the same bit line by the waveforms showing in the item 7.

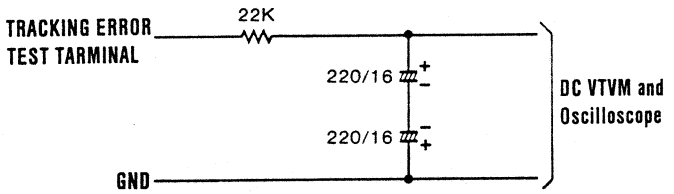
11. Repair the short between **H1** and **F2**.

7. TENTATIVE ADJUSTMENT OF E-F BALANCE

1. Turn the VR605 counterclockwise to the end.

2. Loading the test disc YEDS4 on the turntable, short between the test points **H1** and **F2** on the main board.

3. Connecting the following low-pass filters to the tracking error test terminal, connect them to a DC voltmeter and an oscilloscope.



4. Switching on the power, make sure that the disc stops after several minutes of rotation. Then, keep the PLAY/PAUSE button pressed until the disc restarts to rotate.

5. After the disc starts to rotate, adjust the VR603 for reading the least value on the DC voltmeter.

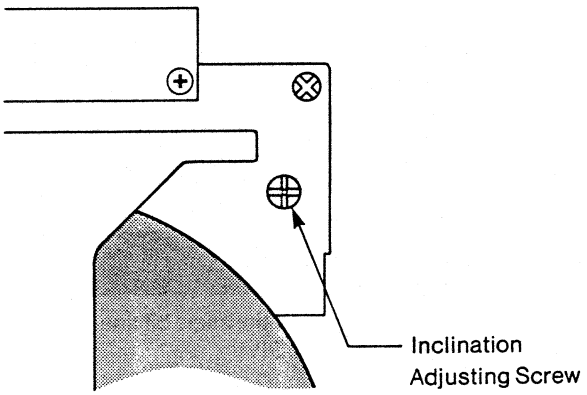
6. Repair the short between **H1** and **F2**.

8. ADJUSTING INCLINATION OF PICKUP

1. Load the test disc YEDS4 on the turntable with the VR605 at the center point.

2. Connect an oscilloscope between the test points, **HF** and **GND** on the Main P.C.Board.

3. Turning on the power, play the fourth tune of the YEDS4. Turn the adjusting screw to get a **HF** waveform with the largest amplitude and a sharp waveform on the oscilloscope.



9. CONFURMING JITTER

This procedure can be omitted in the case that no jitter counter is equipped.

1. As same in the adjustment of the pickup inclination, play the fourth tune of the YEDS4.

2. Connecting the jitter counter to the test point **EFMX** of the Main P.C.Board, make sure that the value of 3T is less than 25nS.

3. In the case of 25nSec or more, adjust again the inclination of the pickup.

10. ADJUSTMENT OF E-F BALANCE

1. After making the same adjustment as in the tentative E-F balance adjustment, adjust the VR603 for getting 0V ±15mV on the DC voltmeter.

11. ADJUSTING STARTING POSITION

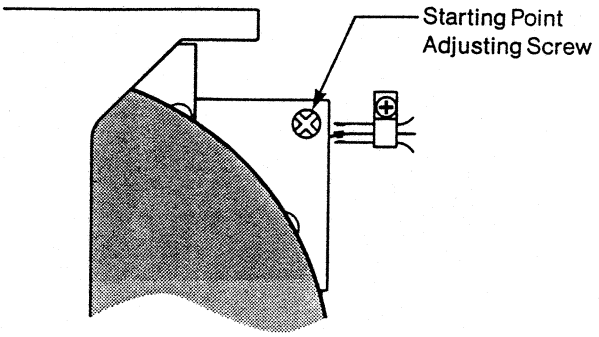
1. Load the test disc YEDS4 on the turntable with the VR605 at the center point.

2. Turning on the power, start the disc. After the initial lead has passed following to a rotation of the disc, short across the test points, **TIME** and **GND** of the Main P.C.Board.

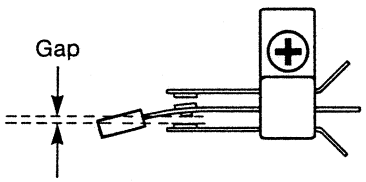
3. At this time, if the value on the TRACK/INDEX counter is not in the range of 1.2 ~ 1.5, repeat the procedures from the initial lead, after turning the starting position adjusting screw.

4. After the indication comes in the range of 1.2 ~ 1.5, make a fine adjustment of the starting point adjusting screw visually further to make the gap of the leaf switch at the inner circumference detector side as follows:

ADJUSTMENT PROCEDURES (Continued)



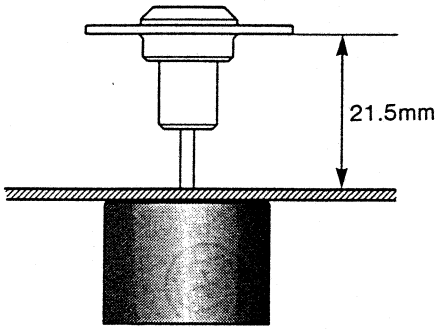
Indication – (Gap of Leaf Switch)
1.2 – (0mm) 1.3 – (0.1mm) 1.4 – (0.2mm) 1.5 – (0.3mm)



12. ADJUSTING HEIGHT OF TURNTABLE

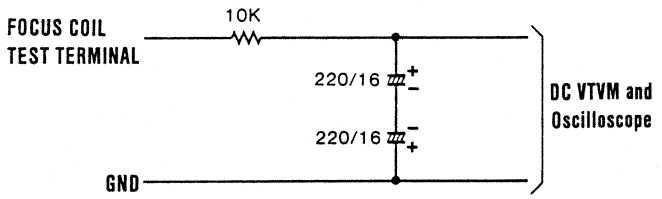
When the motor is replaced, this adjustment is required.

1. Install the turn table as the height from the chassis to the lower end of the turntable is 21.5mm.



2. Load the test disc YEDS4 on the turntable with the VR605 at the center point.

3. Connecting thte following low-pass filter to the focus coil test terminal, connect them to a DC voltmeter and an oscilloscope.

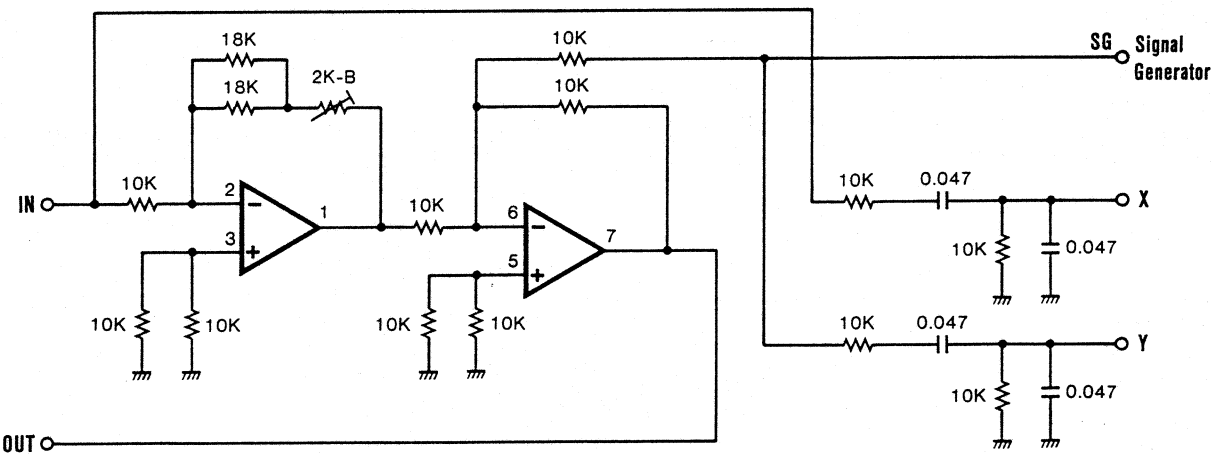


4. Turning on the power, play the first tune of the disc.

5. After checking the voltmeter for reading, adjust the height of the turntable for a reading of 0V ±0.25V. (When the figure of the volt meter shows "+", move up the turntable and when it shows "–", move it doun. In this circuit, it moves by 0.85mm per 1V.)

13. ADJUSTING FOCUS / TRACKING GAIN

The following circuits for measuring is required for adjusting the focus gain and the tracking gain accurately. If this circuit is not available, adjust them by using the plain adjusting method.

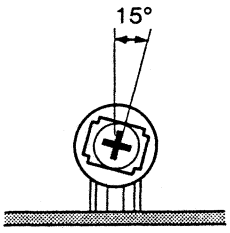


- IC LA64580 or equivalent
- In advance, adjust the semi-fixed volume (2K-B) for the minimum output at the OUT, by shorting across IN and SG, and by applying 1kHz, 1Vp-p from SG.

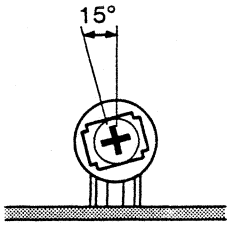
ADJUSTMENT PROCEDURES (Continued)

Plain Adjusting Method

- Adjustment of Focus Gain
  Set the VR602 at clockwise 15° from the center point as show below.



- Adjustment of Tracking Gain
  Set the VR605 at counterclockwise 15° from the center point as shown below.

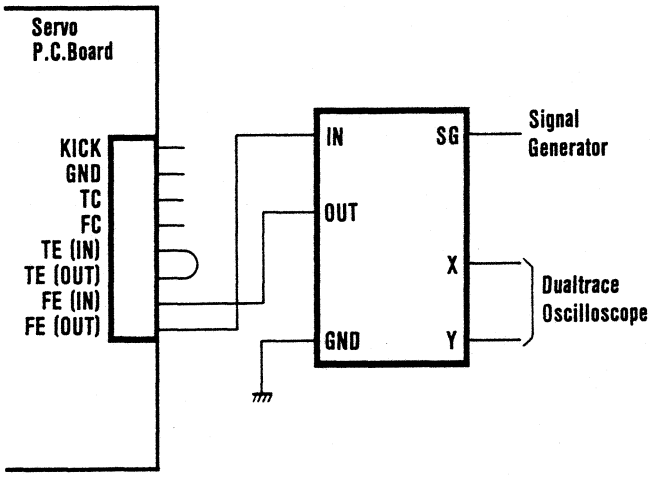


Accurate Adjusting Method

- Adjustment of Focus Gain

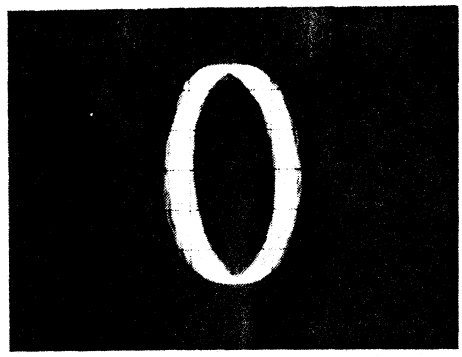
1. With the VR602 at the center point, load the test disc YEDS4 on the turntable.

2. Connect the circuit for measurement shown in the item 13 to the set as follows:



3. Turning on the power, play the first tune and apply a signal of 950Hz/0.5Vp-p from the frequency generator to the circuit for measurement.

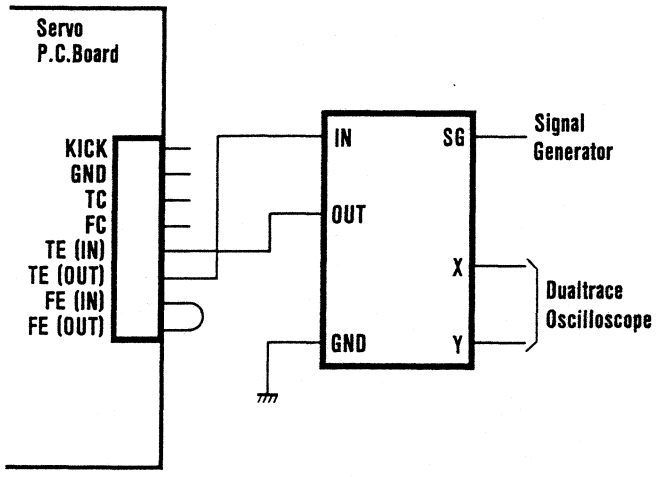
4. Observing the Lissajous's waveforms on the oscilloscope, adjust the VR602 for getting a phase difference of 90° between the outputs on the circuit, X and Y, as follows:



Adjustment of Tracking Gain

1. Load the test disc YEDS4 on the turntable with the VR605 at the center point.

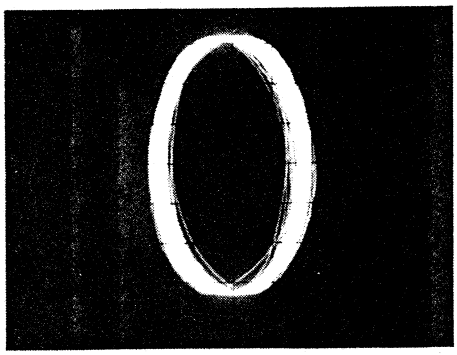
2. Connect the circuit for measurement to the set as follows:



3. Turning on the power, play the first tune and apply a signal of 1300Hz/0.5vp-p from the frequency generator to the circuit for measurement.

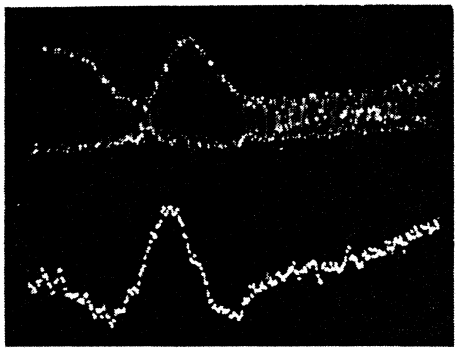
4. Observing the Lissajous's waveforms on the oscilloscope, adjust the VR605 for getting a phase difference of 90° between the outputs on the circuit, X and Y, as follows:

ADJUSTMENT PROCEDURES (Continued)



HF
(1V/DIV
50μSec/DIV)

TE
(0.5V/DIV
50μSec/DIV)



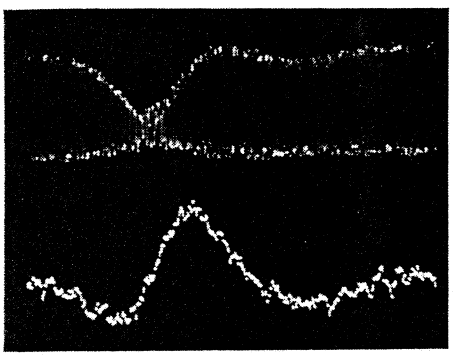
Waveform showing Excessive Kick Gain
(make it in a reasonable state by turning the VR606 clockwise.)

14. ADJUSTMENT OF KICK GAIN

1. Load the test disc YEDS4 on the turn table.
2. Set the oscilloscope at the NORMAL TRIG. and connect the IC102 (YM3531) No. 21 Pin (TRHD) of the Main P.C.Board to the external trigger terminal. Then, connect the channels, 1 and 2, to the test points, **HF** and **TE**, respectively.
3. Switch on the power. In the state of playing the first tune, make it pause and observe the waveforms of **HF** and **TE** triggered by **TRHD**.
4. Adjust the VR606 for making a track jump between 1 and 1.5 track.

HF
(1V/DIV
50μSec/DIV)

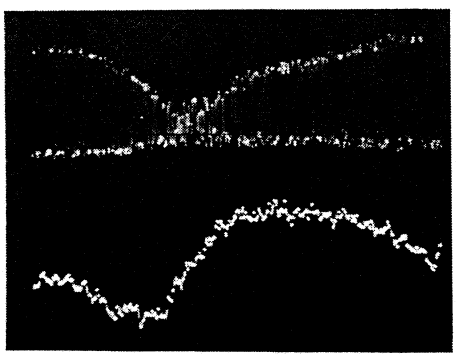
TE
(0.5V/DIV
50μSec/DIV)



Corrected Waveform

HF
(1V/DIV
50μSec/DIV)

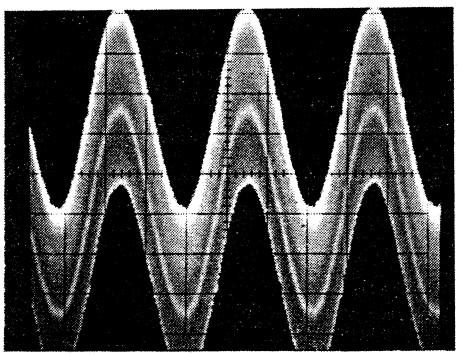
TE
(0.5V/DIV
50μSec/DIV)



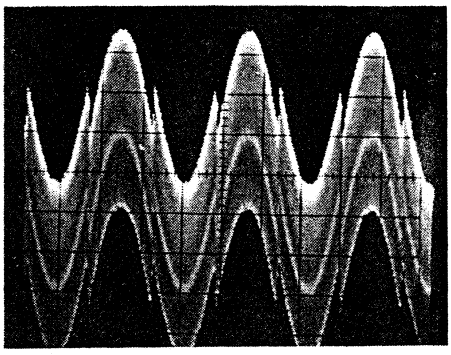
Waveform showing Short Kick Gain
(Make it in a reasonable state by turning the VR606 counterclockwise.)

15. ADJUSTING DAC

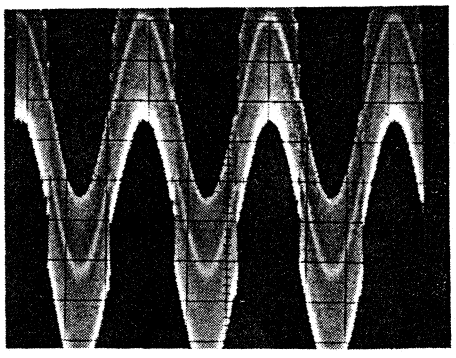
1. Load the test disc YEDS7 on the turntable.
2. Connect the outlet of the set to the AUX terminal of the premain amplifier. Also connect the speaker output of the amplifier to the oscilloscope.
3. Turn on the power. In playing the twenty-first tune apply a reasonable output to the oscilloscope with the volume knob of the premain amplifier.
4. Adjust the VR101 for getting sine waveforms on the oscilloscope.



Proper Waveform

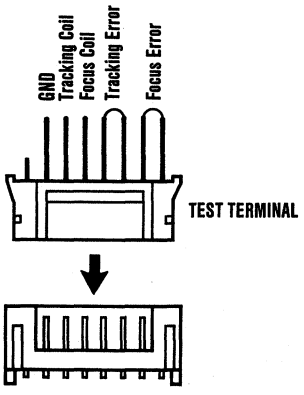


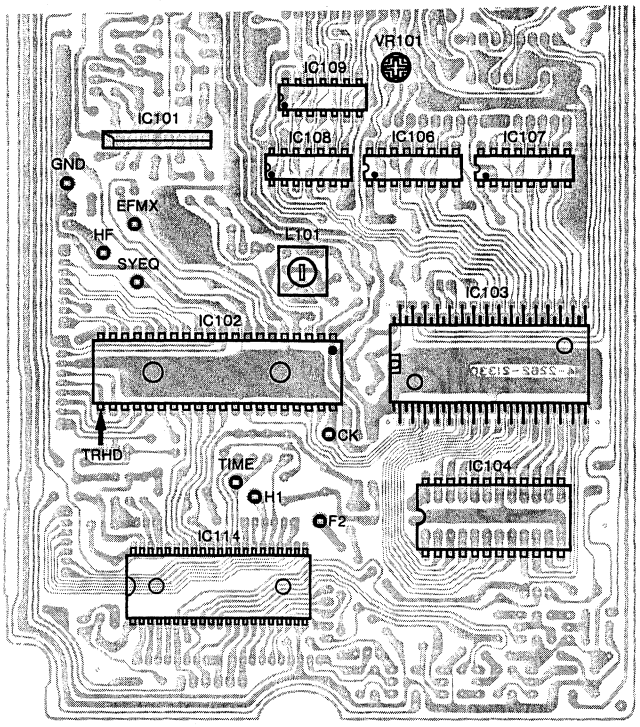
Interrupted Waveform

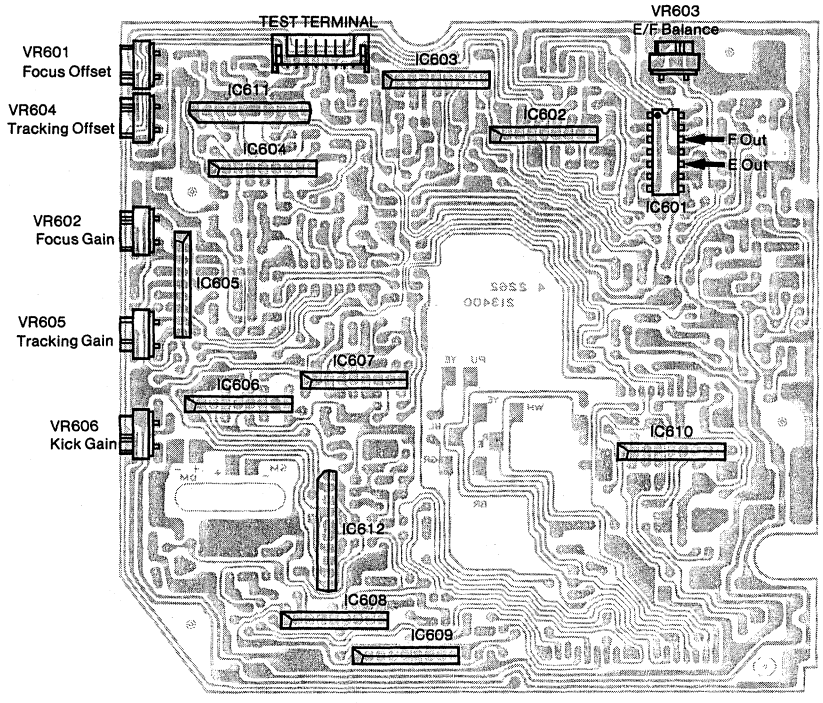


Interrupted Waveform

P.C.BOARD ALIGNMENT POINTS



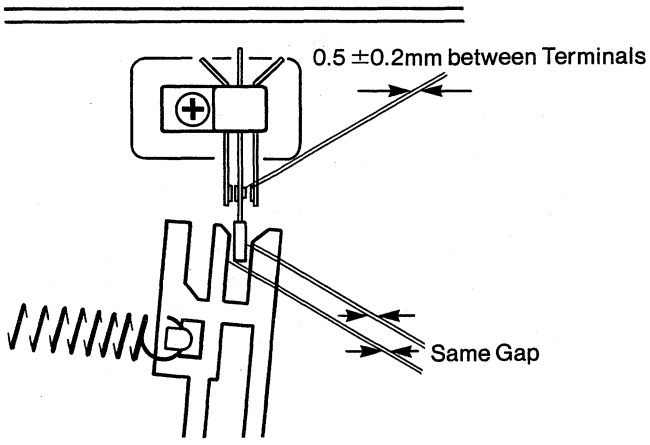




INSTALLATION METHOD FOR EACH LEAF SWITCH

•Table Load Switch

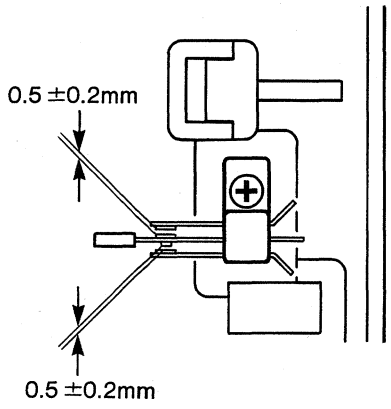
With the table load in the open condition, fix the switch as in the diagram so that the tip of the leaf switch is positioned in the center of the lever rock notch.



Set the space between the left and right terminals of the leaf switch to 0.5 ±0.2mm.

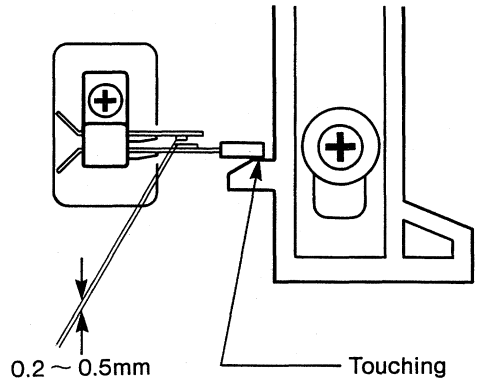
• Pickup Switch

As in the diagram, install level with the chassis.
Set a space of 0.5 ±0.2mm between the upper and lower switch terminals.



• Eject Switch

Install so that the tip of the leaf switch and the slide eject are contacting, as shown in the diagram.
Set a space of 0.2 to 0.5mm between the terminals of the switch.



INPUT PORT ASSIGNMENTS
(MICRO PROCESSOR UNIT IC114)

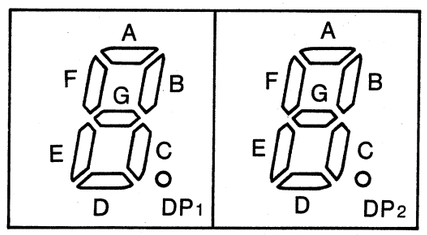
Pin No.	Port Name	Command Name
6	$\overline{INT}$	$\overline{Stope\ Switch}$
26	PH0	Key Scan
27	PH1	
28	PH2	
29	PH3	
31	PI1	Key Scan
32	PI2	(Open/Close)
35	PA2	IC 102
37	PB0	

NOTE:
The signals with lines drawn above their names show that they are active in low level.

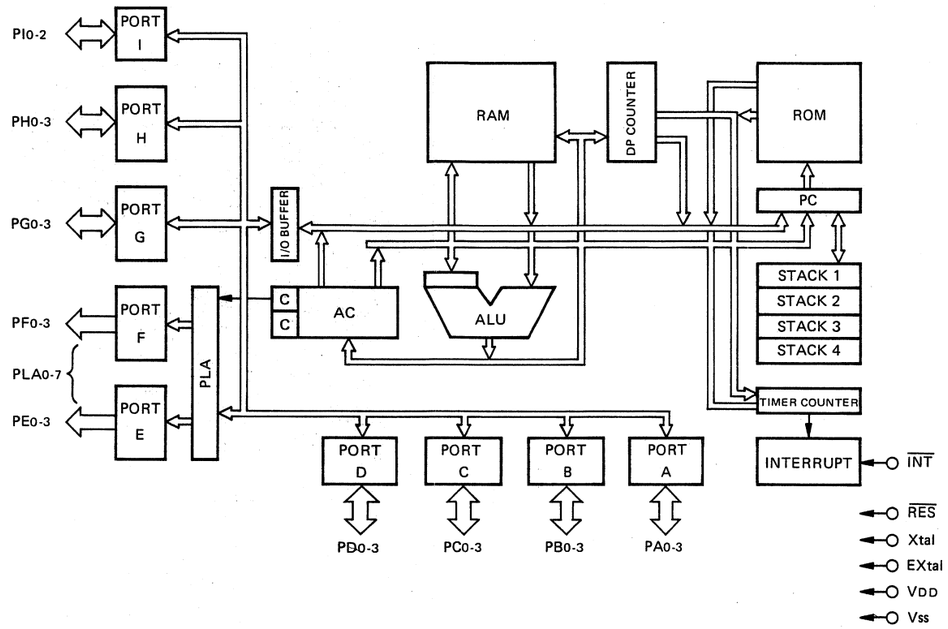
OUTPUT PORT ASSIGNMENTS
(MICRO PROCESSOR UNIT IC114)

Pin No.	Port Name	Command Name
2	PC0	$\overline{PLAY\ Indicator}$
3	PC1	$\overline{PAUSE\ Indicator}$
4	PC2	$\overline{ALL\ Indicator}$
5	PC3	$\overline{ONE\ Indicator}$
8	PD0	$\overline{DP_2\ Display\ LED}$
11	PD3	Digit Change
12	PE0	$\overline{A}$
13	PE1	$\overline{B}$
14	PE2	$\overline{C}$
15	PE3	$\overline{D}$ $\overline{Display\ LED}$
16	PF0	$\overline{E}$
17	PF1	$\overline{F}$
18	PF2	$\overline{G}$
19	PF3	$\overline{DP_1\ Display\ LED}$
22	PG0	Lid Open
23	PG1	Lid Close
24	PG2	Key Scan
25	PG3	
33	PA0	IC 102
34	PA1	
36	PI2	
38	PI2	Laser

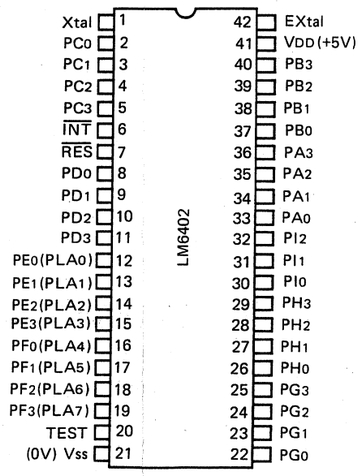
Segment Position



SYSTEM BLOCK DIAGRAM & PIN LOCATION
(MICRO PROCESSOR UNIT IC114)

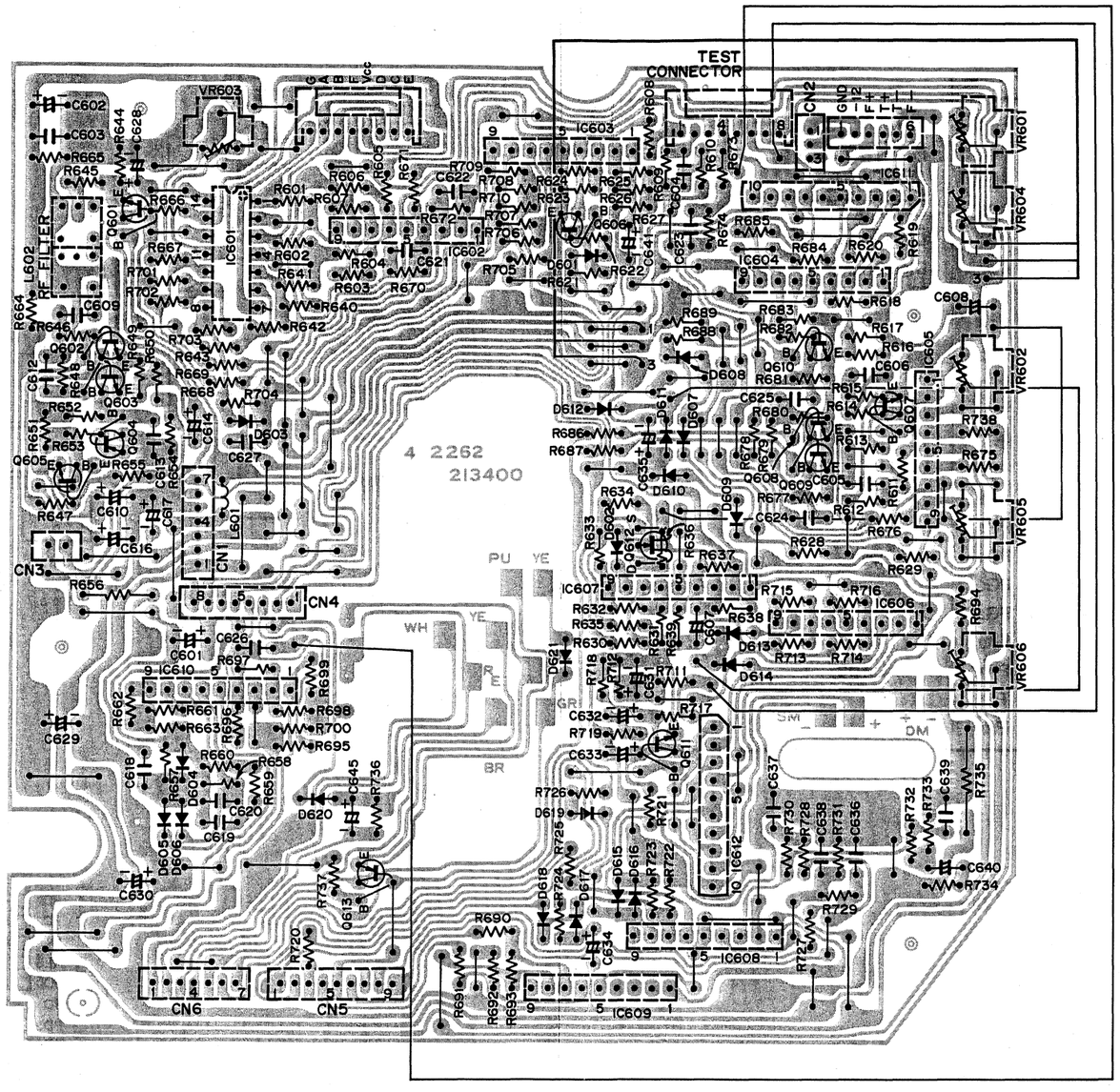


(TOP VIEW)



SERVO P.C.BOARD

(BOTTOM VIEW)



IC PIN NUMBERS DC VOLTAGES

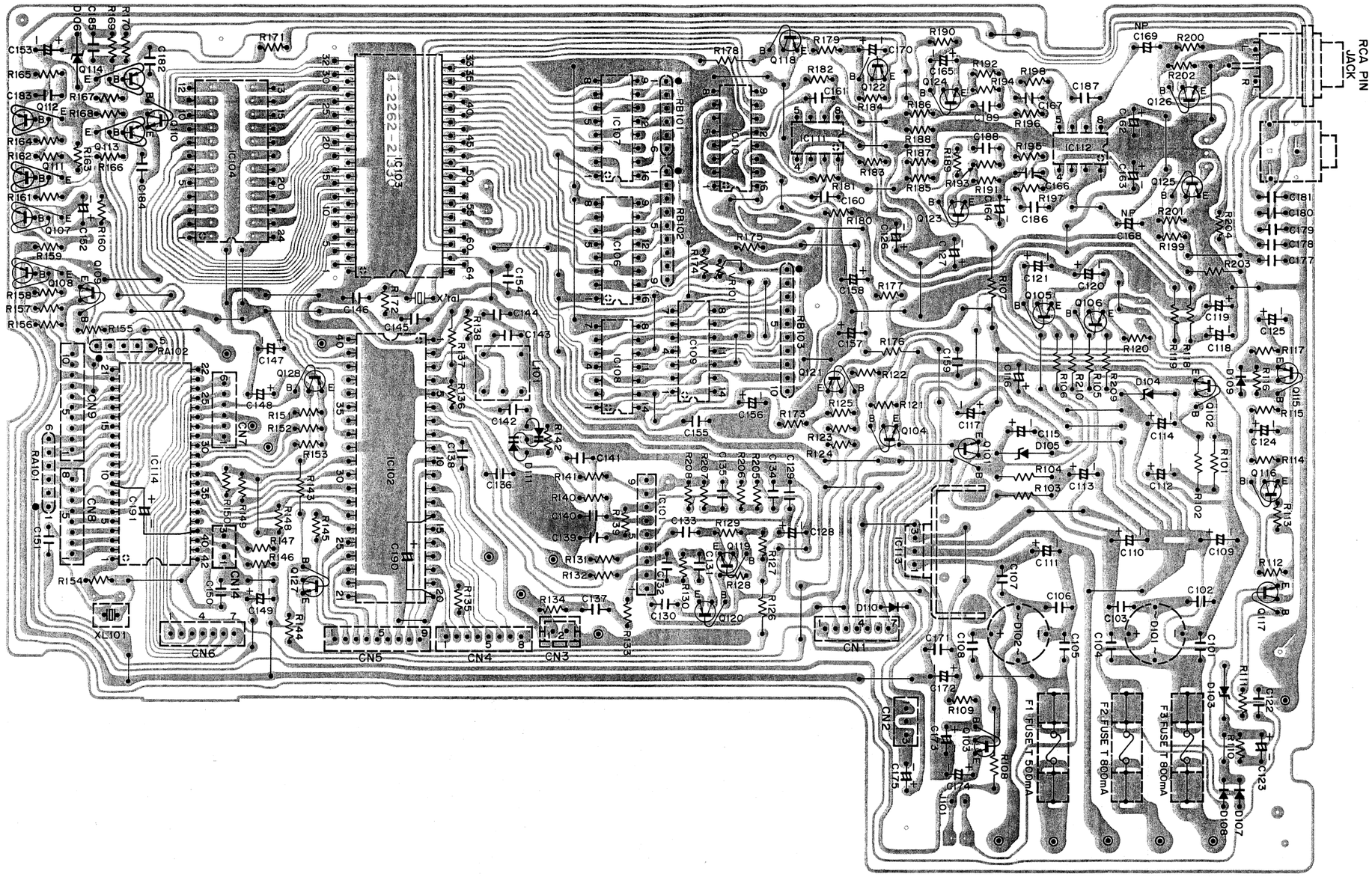
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC601	TC40H004P	2.3V	2.3V	2.3V	2.3V	2.3V	2.3V	0V	2.3V	2.3V	2.3V	2.3V	2.3V	2.3V	4.9V
IC602	NJM4558S	12.8V	0V	2.1V	2.1V	−12.9V	0V	0V	0V	12.8V					
IC603	NJM4558S	12.8V	12.0V	0V	0V	−13.0V	2.2V	3.0V	−11.4V	12.8V					
IC604	NJM4558S	12.9V	1.7V	0V	0V	−13.0V	0V	0V	0V	12.9V					
IC605	NJM4558S	12.9V	0.2V	0V	0V	−13.0V	0V	0V	0V	12.9V					
IC606	NJM4558S	12.9V	−11.7V	0V	−0.4V	−13.0V	0V	0.4V	−11.7V	12.9V					
IC607	NJM4558S	12.9V	−11.7V	0.3V	−0.4V	−13.0V	3.1V	0V	−12.3V	12.9V					
IC608	NJM4558S	12.9V	−0.3V	0V	0V	−13.0V	0V	0V	0.3V	12.9V					
IC609	NJM4558S	12.9V	–	–	–	−13.0V	0V	0V	0V	12.9V					
IC610	NJM4558S	12.9V	−12.9V	0V	−0.2V	−13.0V	0V	0V	−3.8V	12.9V					
IC611	STA451C	−0.9V	13.0V	−1.4V	0V	−0.5V	−0.5V	0V	−1.4V	−13.0V	−0.8V				
IC612	STA451C	0V	12.9V	0.3V	0V	−0.3V	−0.3V	0V	0.3V	−13.0V	0V				

TRANSISTOR DC VOLTAGES

SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E
Q601	2SC536	2.3V	4.8V	1.7V	Q608	2SD1012	0V	0V	0V
Q602	2SC536	0V	12.3V	−0.6V	Q609	2SD1012	0.6V	0V	0V
Q603	2SC536	0V	10.9V	−0.6V	Q610	2SD1012	0V	0V	0V
Q604	2SA608	10.7V	2.4V	11.3V	Q611	2SD1012	0.6V	0V	0V
Q605	2SC536	2.4V	12.9V	1.7V	Q613	2SA608	4.8V	4.8V	0V
Q606	2SD1012	−7.8V	0V	0V			G	D	S
Q607	2SD1012	−1.1V	0.1V	0V	Q612	2SK246	0.4V	0.4V	0.4V

MAIN P.C.BOARD

(BOTTOM VIEW)



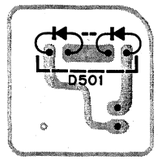
IC PIN NUMBERS DC VOLTAGES

SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IC101	NJM2043S	12.9V	2.0V	2.0V	2.0V	−13.0V	2.4V	2.4V	2.5V	12.8V											
IC110	MSM4053RS	0V	0V	0V	0V	0V	0V	−6.0V	0V	0.9V	0.9V	1.9V	0V	0V	0V	0V	4.8V				
IC111	LM833N	0.6V	0V	0V	−10.3V	0V	0V	0.6V	10.3V												
IC112	NJM4558D	0.6V	0.6V	0.6V	−10.3V	0.6V	0.6V	0.6V	10.3V												
IC114	LM6402H	2.4V	4.9V	4.9V	4.9V	4.9V	4.9V	4.9V	4.9V	4.9V	4.9V	2.5V	4.9V	2.6V	2.6V	4.9V	4.9V	4.9V	4.9V	4.9V	0V
		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
		0V	0V	0V	3.5V	1.7V	4.9V	4.9V	4.9V	4.9V	4.9V	1.7V	2.2V	4.9V	0V	4.9V	0V	0V	4.9V	4.9V	4.9V
		41	42																		
		4.9V	2.4V																		

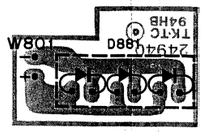
TRANSISTOR DC VOLTAGES

SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E
Q101	2SD612	13.6V	18.0V	12.9V	Q115	2SA608	4.7V	−7.8V	4.8V
Q102	2SB511	−13.0V	−17.3V	−13.6V	Q116	2SC536	0V	4.8V	0V
Q103	2SD734	4.8V	9.1V	4.2V	Q117	2SC536	0.6V	0V	0V
Q104	2SD734	−13.0V	−0.4V	−13.0V	Q118	2SC536	0V	10.1V	0V
Q105	2SD734	13.4V	17.8V	12.7V	Q119	2SC536	0V	1.6V	0V
Q106	2SB698	−13.4V	−17.3V	−12.8V	Q120	2SA608	1.7V	1.8V	2.0V
Q107	2SC536	0V	4.8V	0V	Q121	2SA608	4.9V	−13.0V	4.9V
Q108	2SA608	3.8V	2.1V	4.2V	Q122	2SA608	10.2V	−7.8V	10.3V
Q109	2SA608	4.2V	2.8V	4.2V	Q123,124	2SD1012	−7.7V	0V	0V
Q110	2SC3400	0V	5.0V	0V	Q125,126	2SD1012	−7.7V	0V	0V
Q111,113	2SC536	5.0V	10.0V	5.0V	Q127	2SD1012	−0.4V	0V	0V
Q112,114	2SA608	9.9V	0V	10.0V	Q128	2SA1345	4.9V	4.9V	0V

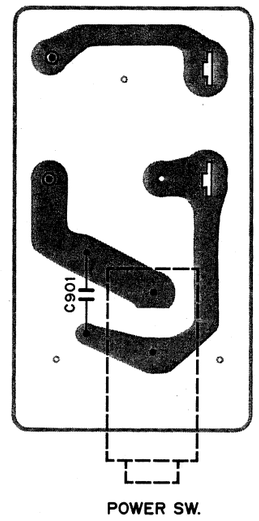
DISK IND. P.C.BOARD
(BOTTOM VIEW)



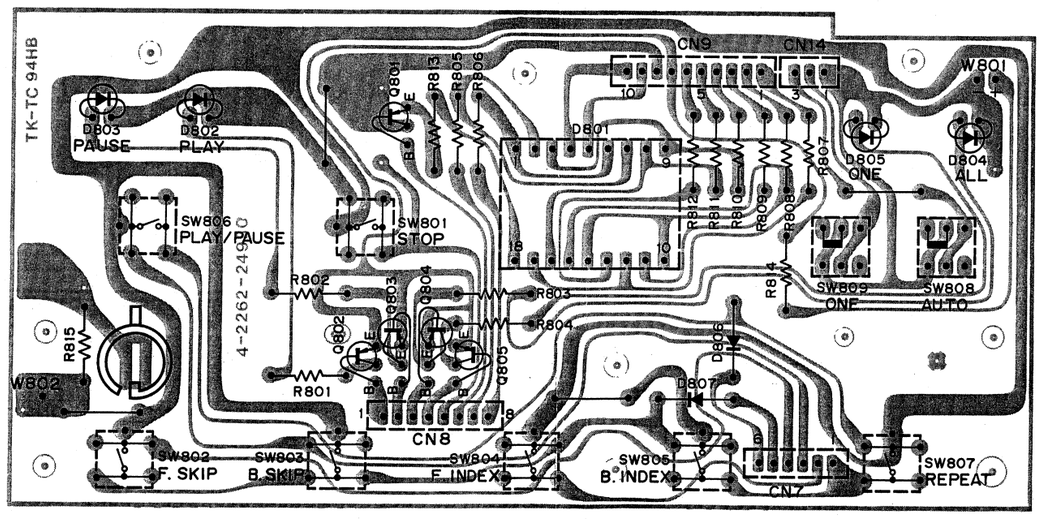
POWER INDICATOR P.C.BOARD
(BOTTOM VIEW)



POWER SWITCH P.C.BOARD
(BOTTOM VIEW)



CONTROL P.C.BOARD
(BOTTOM VIEW)



P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description	Q'ty
	MAIN P.C.B. ASSY		
PCB1	141-0-1939-08265	Main P.C.B. Assy	1
	4-2352-01631	Pin Jack 2P	1
	4-2352-01730	Jack 3P	1
	4-2369-73783	Pin 1P	1
	⚠ 4-2352-01940	Fuse Clip	6
	111-2-6220-11100	Wire Wrap Terminal	13
	131-2-6201-30100	Plate Heat Sink (for IC113)	1
	141-2-3229-43300	Cover Shield	1
	143-3-1903-00611	Screw, Braz. Hd. Tapp.-B, +M3.0x6	1
	131-2-9800-01055	Jumper	1
CN1	4-2369-75040	Plug 7P	1
CN2	4-2369-75020	Plug 3P	1
CN3	4-2362-00770	Plug 2P	1
CN4	4-2369-75050	Plug 8P	1
CN5	4-2369-75060	Plug 9P	1
CN6	4-2369-75040	Plug 7P	1
CN7	4-2369-75030	Plug 6P	1
CN8	4-2369-75050	Plug 8P	1
CN9	4-2369-75070	Plug 10P	1
CN14	4-2369-75020	Plug 3P	1
F1	⚠ 4-2349-20310	Fuse (T 500mA)	1
F2	⚠ 4-2349-21540	Fuse (T 800mA)	1
F3	⚠ 4-2349-21540	Fuse (T 800mA)	1
XL101	4-2259-70780	CSB 800K	1
XL102	4-2259-70771	Crystal	1
L101	4-2589-72670	OSC Coil	1
VR101	4-2229-75890	Semi Fixed (B-470kΩ)	1
D101	DGG---W02---- - - -	Diode, W 02	1
D102	DGG---W02---- - - -	Diode, W 02	1
D103	202-5-3210-08212	Zener Diode, GZA8.2Y	1
D104	202-5-3210-13012	Zener Diode, GZA 13Y	1
D105	202-5-3210-13012	Zener Diode, GZA 13Y	1
D106	202-5-3210-10012	Zener Diode, GZA 10Y	1
D107	202-5-1410-00110	Diode, GMA 01	1
D108	202-5-1410-00110	Diode, GMA 01	1
D109	202-5-1410-00110	Diode, GMA 01	1
D110	202-5-1410-00110	Diode, GMA 01	1
D111	202-5-1250-21110	Diode, SVC 211 SP	1
IC101	4-2069-73450	IC, NJM 2043 S	1
IC102	4-2069-73960	IC, YM 3531 SVC	1
IC103	4-2069-73550	IC, YM 2201 SGP	1
IC104	4-2069-73480	IC, μPD 4016 CX	1
IC106	206-5-7854-05010	IC, LC 4050 B	1
IC107	206-5-7854-05010	IC, LC 4050 B	1
IC108	4-2069-74850	IC, TC 74 HC 32	1
IC109	4-2069-74840	IC, TC 74 HC 08	1
IC110	4-2069-72640	IC, MSM 4053 RS	1
IC111	4-2069-72430	IC, LM 833 N	1
IC112	IJJ---NJM4-558DX	IC, NJM 4558 DX	1
IC113	206-5-2040-07805	IC, L 78 M 05	1
IC114	208-5-7716-40246	IC, LM 6402 H 462	1
Q101	203-5-7330-61250	Transistor, 2SD 612	1
Q102	203-5-8520-51150	Transistor, 2SB 511	1
Q103	203-5-4570-73452	Transistor, 2SD 734	1
Q104	203-5-4570-73452	Transistor, 2SD 734	1
Q105	203-5-4570-73452	Transistor, 2SD 734	1
Q106	203-5-4580-69850	Transistor, 2SB 698	1
Q107	203-5-5000-53650	Transistor, 2SC 536	1
Q108	203-5-7230-60850	Transistor, 2SA 608	1
Q109	203-5-7230-60850	Transistor, 2SA 608	1
Q110	203-5-1313-40010	Transistor, 2SC 3400	1
Q111	203-5-5000-53650	Transistor, 2SC 536	1
Q112	203-5-7230-60850	Transistor, 2SA 608	1
Q113	203-5-5000-53650	Transistor, 2SC 536	1
Q114	203-5-7230-60850	Transistor, 2SA 608	1
Q115	203-5-7230-60850	Transistor, 2SA 608	1
Q116	203-5-5000-53650	Transistor, 2SC 536	1
Q117	203-5-5000-53650	Transistor, 2SC 536	1
Q118	203-5-5000-53650	Transistor, 2SC 536	1
Q119	203-5-5000-53650	Transistor, 2SC 536	1
Q120	203-5-7230-60850	Transistor, 2SA 608	1
Q121	203-5-7230-60850	Transistor, 2SA 608	1
Q122	203-5-7230-60850	Transistor, 2SA 608	1
Q123	203-5-4921-01274	Transistor, 2SD 1012	1
Q124	203-5-4921-01274	Transistor, 2SD 1012	1
Q125	203-5-4920-01274	Transistor, 2SD 1012	1
Q126	203-5-4920-01274	Transistor, 2SD 1012	1
Q127	203-5-4920-01274	Transistor, 2SD 1012	1
Q128	203-5-1220-34510	Transistor, 2SA 1345	1
C101	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C102	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C103	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C104	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C105	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C106	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C107	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C108	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C109	CD2-2-8250-0006V	Electrolytic 2200μF 25V	1
C110	CD2-2-8250-0006V	Electrolytic 2200μF 25V	1
C111	CD2-2-8160-0006V	Electrolytic 2200μF 16V	1
C112	CD2-2-7250-0006V	Electrolytic 220μF 25V	1
C113	CD2-2-7250-0006V	Electrolytic 220μF 25V	1
C114	CD4-7-6160-0001V	Electrolytic 47μF 16V	1
C115	CD4-7-6160-0001V	Electrolytic 47μF 16V	1
C116	CD1-0-6250-0001V	Electrolytic 10μF 25V	1
C117	CD1-0-6250-0001V	Electrolytic 10μF 25V	1
C118	CD1-0-6250-0001V	Electrolytic 10μF 25V	1
C119	CD1-0-6250-0001V	Electrolytic 10μF 25V	1
C120	CD1-0-7160-0001V	Electrolytic 100μF 16V	1
C121	CD1-0-7160-0001V	Electrolytic 100μF 16V	1
C122	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C123	CD1-0-5500-0001V	Electrolytic 1μF 50V	1
C124	CD1-0-6250-0001V	Electrolytic 10μF 25V	1
C125	CD3-3-763A-0006V	Electrolytic 330μF 6.3V	1
C126	CD4-7-7160-0006V	Electrolytic 470μF 16V	1
C127	CD4-7-7160-0006V	Electrolytic 470μF 16V	1
C128	CD1-0-6250-0001V	Electrolytic 10μF 25V	1
C129	CC2-2-3500-ZG00C	Ceramic 0.022μF 50V +80,-20%	1
C130	CC2-2-3500-ZG00C	Ceramic 0.022μF 50V +80,-20%	1
C131	CM1-0-4500-J00TV	Mylar 0.1μF 50V ±5%	1
C132	CM1-0-2500-K00SV	Mylar 0.001μF 50V ±10%	1
C133	CM1-0-4500-J00TV	Mylar 0.1μF 50V ±5%	1
C134	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80,-20%	1
C135	CM3-3-2500-K00SV	Mylar 0.0033μF 50V ±10%	1
C136	CC1-0-1500-JD00C	Ceramic 100pF 50V ±5%	1
C137	CM1-0-4500-J00TV	Mylar 0.1μF 50V ±5%	1
C138	CC1-5-1500-JD00C	Ceramic 150pF 50V ±5%	1
C139	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1
C140	CC4-7-1500-KD00C	Ceramic 470pF 50V ±10%	1
C141	CS1-0-2500-J000V	Polystyroul 1000pF 50V ±5%	1
C142	CM1-0-3500-J00SV	Mylar 0.01μF 50V ±5%	1
C143	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80,-20%	1
C144	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80,-20%	1
C145	CC3-0-0500-JCH0C	Ceramic 30pF 50V ±5%	1
C146	CC3-0-0500-JCH0C	Ceramic 30pF 50V ±5%	1
C147	CD2-2-763A-0001V	Electrolytic 220μF 6.3V	1
C148	CD1-0-5500-0001V	Electrolytic 1μF 50V	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description				Q'ty
C149	CD1-0-6160-0001V	Electrolytic	10μF	16V		1
C150	CS2-2-1500-J000V	Polystyroul	220pF	50V	±5%	1
C151	CS2-2-1500-J000V	Polystyroul	220pF	50V	±5%	1
C152	CD3-3-6160-0001V	Electrolytic	33μF	16V		1
C153	CD4-7-6160-0001V	Electrolytic	47μF	16V		1
C154	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80,-20%	1
C155	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80,-20%	1
C156	CD1-0-863A-0006V	Electrolytic	1000μF	6.3V		1
C157	CD1-0-6250-0001V	Electrolytic	10μF	25V		1
C158	CD1-0-6250-0001V	Electrolytic	10μF	25V		1
C159	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80,-20%	1
C160	CC6-8-0500-JD01R	Ceramic	68pF	50V	±5%	1
C161	CC6-8-0500-JD01R	Ceramic	68pF	50V	±5%	1
C162	CD1-0-7160-0001V	Electrolytic	100μF	16V		1
C163	CD1-0-7160-0001V	Electrolytic	100μF	16V		1
C164	CD4-7-6250-0001V	Electrolytic	47μF	25V		1
C165	CD4-7-6250-0001V	Electrolytic	47μF	25V		1
C166	CS2-8-2500-G000V	Polystyroul	0.0028μF	50V	±2%	1
C167	CS2-8-2500-G000V	Polystyroul	0.0028μF	50V	±2%	1
C168	CB4-7-5160-0000V	None-polar	4.7μF	16V		1
C169	CB4-7-5160-0000V	None-polar	4.7μF	16V		1
C170	CD1-0-5500-0001V	Electrolytic	1μF	50V		1
C171	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80,-20%	1
C172	CD1-0-6250-0001V	Electrolytic	10μF	25V		1
C173	CD1-0-6250-0001V	Electrolytic	10μF	25V		1
C174	CD4-7-5250-0001V	Electrolytic	4.7μF	25V		1
C175	CD1-0-6250-0001V	Electrolytic	10μF	25V		1
C177	CC1-0-2500-KE00C	Ceramic	0.001μF	50V	±10%	1
C178	CC1-0-2500-KE00C	Ceramic	0.001μF	50V	±10%	1
C179	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V	+80,-20%	1
C180	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V	+80,-20%	1
C181	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V	+80,-20%	1
C182	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V	+80,-20%	1
C183	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V	+80,-20%	1
C184	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V	+80,-20%	1
C185	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V	+80,-20%	1
C186	CM1-2-3500-J00TV	Mylar	0.012μF	50V	±5%	1
C187	CM1-2-3500-J00TV	Mylar	0.012μF	50V	±5%	1
C188	CM6-8-3500-J00TV	Mylar	0.068μF	50V	±5%	1
C189	CM6-8-3500-J00TV	Mylar	0.068μF	50V	±5%	1
C190	CD1-0-763A-0001V	Electrolytic	100μF	6.3V		1
C191	CD4-7-6100-0001V	Electrolytic	47μF	10V		1
R101	RF4-7-1251-JH000	Mold	470Ω	1/4W	±5%	1
R102	RF4-7-1251-JH000	Mold	470Ω	1/4W	±5%	1
R103	RF4-7-1251-JH000	Mold	470Ω	1/4W	±5%	1
R104	RF4-7-1251-JH000	Mold	470Ω	1/4W	±5%	1
R105	RD1-5-2251-JM000	Carbon	1.5kΩ	1/4W	±5%	1
R106	RD1-5-2251-JM000	Carbon	1.5kΩ	1/4W	±5%	1
R107	RH4-7-1501-JZ000	Metal	470Ω	1/2W	±5%	1
R108	RH8-2-1501-JZ000	Metal	820Ω	1/2W	±5%	1
R109	RD6-8-1161-JH000	Carbon	680Ω	1/6W	±5%	1
R110	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R111	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R112	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R113	RD1-5-3161-JH000	Carbon	15kΩ	1/6W	±5%	1
R114	RD1-0-0161-JH000	Carbon	10Ω	1/6W	±5%	1
R115	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R116	RD1-2-4161-JH000	Carbon	120kΩ	1/6W	±5%	1
R117	RD2-2-1161-JH000	Carbon	220Ω	1/6W	±5%	1
R118	RD2-7-1251-JM000	Carbon	270Ω	1/4W	±5%	1
R119	RD2-7-1251-JM000	Carbon	270Ω	1/4W	±5%	1
R120	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R121	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R122	RD2-2-2161-JH000	Carbon	2.2kΩ	1/6W	±5%	1

Ref. No.	Part No.	Description				Q'ty
R123	RD3-3-2161-JH000	Carbon	3.3kΩ	1/6W	±5%	1
R124	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R125	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R126	RD2-2-3251-JM000	Carbon	22kΩ	1/4W	±5%	1
R127	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R128	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R129	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R130	RD1-0-5161-JH000	Carbon	1MΩ	1/6W	±5%	1
R131	RD6-8-2161-JH000	Carbon	6.8kΩ	1/6W	±5%	1
R132	RD6-8-2161-JH000	Carbon	6.8kΩ	1/6W	±5%	1
R133	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R134	RD4-7-1161-JH000	Carbon	470Ω	1/6W	±5%	1
R135	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R136	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R137	RD2-2-3251-JM000	Carbon	22kΩ	1/4W	±5%	1
R138	RD1-5-2161-JH000	Carbon	1.5kΩ	1/6W	±5%	1
R139	RD3-3-2161-JH000	Carbon	3.3kΩ	1/6W	±5%	1
R140	RD2-2-2161-JH000	Carbon	2.2kΩ	1/6W	±5%	1
R141	RD2-2-1161-JH000	Carbon	220Ω	1/6W	±5%	1
R142	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R143	RD1-0-3251-JM000	Carbon	10kΩ	1/4W	±5%	1
R144	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R145	RD1-5-3161-JH000	Carbon	15kΩ	1/6W	±5%	1
R146	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R147	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R148	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R149	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R150	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R151	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R152	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R153	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R154	RD1-0-5161-JH000	Carbon	1MΩ	1/6W	±5%	1
R155	RD3-3-2161-JH000	Carbon	3.3kΩ	1/6W	±5%	1
R156	RD2-2-2161-JH000	Carbon	2.2kΩ	1/6W	±5%	1
R157	RD2-7-2161-JH000	Carbon	2.7kΩ	1/6W	±5%	1
R158	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R159	RD1-5-3161-JH000	Carbon	15kΩ	1/6W	±5%	1
R160	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R161	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R162	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R163	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R164	RD4-7-4161-JH000	Carbon	470kΩ	1/6W	±5%	1
R165	RD4-7-1161-JH000	Carbon	470Ω	1/6W	±5%	1
R166	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R167	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R168	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R169	RD4-7-4161-JH000	Carbon	470kΩ	1/6W	±5%	1
R170	RD4-7-1161-JH000	Carbon	470Ω	1/6W	±5%	1
R171	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R172	RD1-0-5161-JH000	Carbon	1MΩ	1/6W	±5%	1
R173	RD4-7-1161-JH000	Carbon	470Ω	1/6W	±5%	1
R174	RD6-8-1161-JH000	Carbon	680Ω	1/6W	±5%	1
R175	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R176	RD4-7-2251-JM000	Carbon	4.7kΩ	1/4W	±5%	1
R177	RD4-7-1161-JH000	Carbon	470Ω	1/6W	±5%	1
R178	RD1-0-3251-JM000	Carbon	10kΩ	1/4W	±5%	1
R179	RD1-2-3161-JH000	Carbon	12kΩ	1/6W	±5%	1
R180	RD2-7-3161-JH000	Carbon	27kΩ	1/6W	±5%	1
R181	RD8-2-2161-JH000	Carbon	8.2kΩ	1/6W	±5%	1
R182	RD8-2-2161-JH000	Carbon	8.2kΩ	1/6W	±5%	1
R183	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R184	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R185	RD4-7-1161-JH000	Carbon	470Ω	1/6W	±5%	1
R186	RD4-7-1161-JH000	Carbon	470Ω	1/6W	±5%	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description				Q'ty
R187	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R188	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R189	RD8-2-2161-JH000	Carbon	8.2kΩ	1/6W	±5%	1
R190	RD8-2-2161-JH000	Carbon	8.2kΩ	1/6W	±5%	1
R191	RD2-2-4161-JH000	Carbon	220kΩ	1/6W	±5%	1
R192	RD2-2-4161-JH000	Carbon	220kΩ	1/6W	±5%	1
R193	RD1-8-1161-JH000	Carbon	180Ω	1/6W	±5%	1
R194	RD1-8-1161-JH000	Carbon	180Ω	1/6W	±5%	1
R195	RD6-8-1161-JH000	Carbon	680Ω	1/6W	±5%	1
R196	RD6-8-1161-JH000	Carbon	680Ω	1/6W	±5%	1
R197	RD8-2-1161-JH000	Carbon	820Ω	1/6W	±5%	1
R198	RD8-2-1161-JH000	Carbon	820Ω	1/6W	±5%	1
R199	RD1-0-2161-JH000	Carbon	1kΩ	1/6W	±5%	1
R200	RD1-0-2161-JH000	Carbon	1kΩ	1/6W	±5%	1
R201	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R202	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R203	RD6-8-2251-JM000	Carbon	6.8kΩ	1/4W	±5%	1
R204	RD6-8-2161-JH000	Carbon	6.8kΩ	1/6W	±5%	1
R205	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R206	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R207	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R208	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R209	RF2-7-0251-JH000	Mold	21Ω	1/4W	±5%	1
R210	RF2-7-0251-JH000	Mold	21Ω	1/4W	±5%	1
RA101	4-2219-70590	RM5-103J				1
RA102	4-2219-71270	Resistor				1
RB101	4-2219-71290	Resistor				1
RB102	4-2219-71300	Resistor				1
RB103	4-2219-71310	Resistor				1
	SERVO P.C.B. ASSY					
PCB2	141-0-1939-08270	Servo P.C.B. Assy				1
	4-2359-78036	Connector 8P Assy (Test)				1
	4-2369-75010	Plug 8P				2
	4-2539-71980	RF Filter				1
	131-2-9800-01029	Jumper				1
CN1	4-2359-77970	Connector 7P Assy				1
CN2	4-2359-77971	Connector 3P Assy				1
CN3	4-2359-77698	Connector 2P Assy				1
CN4	4-2359-77972	Connector 8P Assy				1
CN5	4-2359-77973	Connector 9P Assy				1
CN6	4-2359-77974	Connector 7P Assy				1
CN7	4-2359-77981	Connector 6P Assy				1
L601	4-2539-72010	Choke Coil (100μH)				1
VR601	4-2229-74280	Semi Fixed (B-47kΩ)				1
VR602	4-2229-74270	Semi Fixed (B-100kΩ)				1
VR603	4-2229-74241	Semi Fixed (B-47kΩ)				1
VR604	4-2229-74270	Semi Fixed (B-100kΩ)				1
VR605	4-2229-74290	Semi Fixed (B-33kΩ)				1
VR606	4-2229-74320	Semi Fixed (B-470kΩ)				1
D601	202-5-1410-00110	Diode, GMA 01				1
D602	202-5-1410-00110	Diode, GMA 01				1
D603	202-5-1410-00110	Diode, GMA 01				1
D604	202-5-1410-00110	Diode, GMA 01				1
D605	202-5-1410-00110	Diode, GMA 01				1
D606	202-5-1410-00110	Diode, GMA 01				1
D607	202-5-1410-00110	Diode, GMA 01				1
D608	202-5-1410-00110	Diode, GMA 01				1
D609	202-5-1410-00110	Diode, GMA 01				1
D610	202-5-1410-00110	Diode, GMA 01				1
D611	202-5-1410-00110	Diode, GMA 01				1
D612	202-5-1410-00110	Diode, GMA 01				1
D613	202-5-1410-00110	Diode, GMA 01				1

Ref. No.	Part No.	Description				Q'ty
D614	202-5-1410-00110	Diode, GMA 01				1
D615	202-5-1410-00110	Diode, GMA 01				1
D616	202-5-1410-00110	Diode, GMA 01				1
D617	202-5-1410-00110	Diode, GMA 01				1
D618	202-5-1410-00110	Diode, GMA 01				1
D619	202-5-1410-00110	Diode, GMA 01				1
D620	202-5-1410-00110	Diode, GMA 01				1
D621	202-5-1410-00110	Diode, GMA 01				1
IC601	4-2039-71250	IC, TC 40 H 004 P				1
IC602	4-2069-74710	IC, NJM 4558 S				1
IC603	4-2069-74710	IC, NJM 4558 S				1
IC604	4-2069-74710	IC, NJM 4558 S				1
IC605	4-2069-74710	IC, NJM 4558 S				1
IC606	4-2069-74710	IC, NJM 4558 S				1
IC607	4-2069-74710	IC, NJM 4558 S				1
IC608	4-2069-74710	IC, NJM 4558 S				1
IC609	4-2069-74710	IC, NJM 4558 S				1
IC610	4-2069-74730	IC, TA 75393 S				1
IC611	4-2069-73490	IC, STA 451 C				1
IC612	4-2069-73490	IC, STA 451 C				1
Q601	203-5-5000-53650	Transistor, 2SC 536				1
Q602	203-5-5000-53650	Transistor, 2SC 536				1
Q603	203-5-5000-53650	Transistor, 2SC 536				1
Q604	203-5-7230-60850	Transistor, 2SA 608				1
Q605	203-5-5000-53650	Transistor, 2SC 536				1
Q606	203-5-4921-01260	Transistor, 2SD 1012				1
Q607	203-5-4921-01260	Transistor, 2SD 1012				1
Q608	203-5-4921-01260	Transistor, 2SD 1012				1
Q609	203-5-4921-01260	Transistor, 2SD 1012				1
Q610	203-5-4921-01260	Transistor, 2SD 1012				1
Q611	203-5-4921-01260	Transistor, 2SD 1012				1
Q612	4-2039-71412	FET, 2SK 246				1
Q613	203-5-7230-60850	Transistor, 2SA 608				1
C601	CD1-0-763A-0002V	Electrolytic	100μF	6.3V		1
C602	CD4-7-6160-0006V	Electrolytic	47μF	16V		1
C603	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80,-20%	1
C604	CM2-2-3500-J00TV	Mylar	0.022μF	50V	±5%	1
C605	CM2-2-4500-J00TV	Mylar	0.22μF	50V	±5%	1
C606	CM6-8-4500-J00TV	Mylar	0.68μF	50V	±5%	1
C607	CB2-2-6250-0000V	None-polar	22μF	25V		1
C608	CB4-7-5160-0000V	None-polar	4.7μF	16V		1
C609	CM1-0-4500-J00TV	Mylar	0.1μF	50V	±5%	1
C610	CD4-7-6160-0006V	Electrolytic	47μF	16V		1
C612	CM3-3-3500-J00TV	Mylar	0.033μF	50V	±5%	1
C613	CC1-0-0500-JD01R	Ceramic	10pF	50V	±5%	1
C614	CD4-7-6160-0006V	Electrolytic	47μF	16V		1
C616	CD1-0-6160-0002V	Electrolytic	10μF	16V		1
C617	CD1-0-6160-0002V	Electrolytic	10μF	16V		1
C618	CM3-3-2500-K00SV	Mylar	0.0033μF	50V	±10%	1
C619	CM3-3-3500-J00TV	Mylar	0.033μF	50V	±5%	1
C620	CC3-9-1500-KE01R	Ceramic	390pF	50V	±10%	1
C621	CC2-2-1500-KE01R	Ceramic	220pF	50V	±10%	1
C622	CC2-2-1500-KE01R	Ceramic	220pF	50V	±10%	1
C623	CM8-2-3500-J00TV	Mylar	0.082μF	50V	±5%	1
C624	CM2-2-4500-J00TV	Mylar	0.22μF	50V	±5%	1
C625	CM4-7-4500-J00TV	Mylar	0.47μF	50V	±5%	1
C626	CM1-0-3500-J00TV	Mylar	0.01μF	50V	±5%	1
C627	CM3-3-4500-J00TV	Mylar	0.33μF	50V	±5%	1
C628	CD1-0-6160-0002V	Electrolytic	10μF	16V		1
C629	CD2-2-7160-0006V	Electrolytic	220μF	16V		1
C630	CD2-2-7160-0006V	Electrolytic	220μF	16V		1
C631	CD1-0-6160-0002V	Electrolytic	10μF	16V		1
C632	CD1-0-7100-0006V	Electrolytic	100μF	10V		1
C633	CD2-2-5500-0002V	Electrolytic	2.2μF	50V		1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description				Q'ty
C634	CD3-3-6160-0002V	Electrolytic	33μF	16V		1
C635	CD2-2-6100-0001V	Electrolytic	22μF	10V		1
C636	CM1-2-3500-J00TV	Mylar	0.012μF	50V	±5%	1
C637	CM1-2-3500-J00TV	Mylar	0.012μF	50V	±5%	1
C638	CM2-2-2500-K00SV	Mylar	0.0022μF	50V	±10%	1
C639	CM2-2-2500-K00SV	Mylar	0.0022μF	50V	±10%	1
C640	CB2-2-5250-0000V	None-polar	2.2μF	25V		1
C641	CD1-0-6160-0001V	Electrolytic	10μF	16V		1
C645	CD1-0-763A-0002V	Electrolytic	100μF	6.3V		1
R601	RD6-8-2161-JH000	Carbon	6.8kΩ	1/6W	±5%	1
R602	RD6-8-2161-JH000	Carbon	6.8kΩ	1/6W	±5%	1
R603	RD1-0-2161-JH000	Carbon	1kΩ	1/6W	±5%	1
R604	RD1-0-2161-JH000	Carbon	1kΩ	1/6W	±5%	1
R605	RD5-6-4161-JH000	Carbon	560kΩ	1/6W	±5%	1
R606	RD5-1-3161-JH000	Carbon	51kΩ	1/6W	±5%	1
R607	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R608	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R609	RD3-3-3161-JH000	Carbon	33kΩ	1/6W	±5%	1
R610	RD3-3-2161-JH000	Carbon	3.3kΩ	1/6W	±5%	1
R611	RD5-6-2161-JH000	Carbon	5.6kΩ	1/6W	±5%	1
R612	RD5-6-2161-JH000	Carbon	5.6kΩ	1/6W	±5%	1
R613	RD2-7-3161-JH000	Carbon	27kΩ	1/6W	±5%	1
R614	RD1-2-3161-JH000	Carbon	12kΩ	1/6W	±5%	1
R615	RD2-7-2161-JH000	Carbon	2.7kΩ	1/6W	±5%	1
R616	RD3-3-3161-JH000	Carbon	33kΩ	1/6W	±5%	1
R617	RD8-2-3161-JH000	Carbon	82kΩ	1/6W	±5%	1
R618	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R619	RD2-7-4161-JH000	Carbon	270kΩ	1/6W	±5%	1
R620	RD6-8-1161-JH000	Carbon	680Ω	1/6W	±5%	1
R621	RD1-8-4161-JH000	Carbon	180kΩ	1/6W	±5%	1
R622	RD3-3-3161-JH000	Carbon	33kΩ	1/6W	±5%	1
R623	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R624	RD1-2-4161-JH000	Carbon	120kΩ	1/6W	±5%	1
R625	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R626	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R627	RD3-3-2161-JH000	Carbon	3.3kΩ	1/6W	±5%	1
R628	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R629	RD1-8-4161-JH000	Carbon	180kΩ	1/6W	±5%	1
R630	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R631	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R632	RD1-5-3161-JH000	Carbon	15kΩ	1/6W	±5%	1
R633	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R634	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R635	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R636	RD1-8-2161-JH000	Carbon	1.8kΩ	1/6W	±5%	1
R637	RD1-5-4161-JH000	Carbon	150kΩ	1/6W	±5%	1
R638	RD3-9-4161-JH000	Carbon	390kΩ	1/6W	±5%	1
R639	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R640	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R641	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R642	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R643	RD2-2-2161-JH000	Carbon	2.2kΩ	1/6W	±5%	1
R644	RD2-2-2161-JH000	Carbon	2.2kΩ	1/6W	±5%	1
R645	RD4-7-1161-JH000	Carbon	470Ω	1/6W	±5%	1
R646	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R647	RD1-5-4161-JH000	Carbon	150kΩ	1/6W	±5%	1
R648	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R649	RD2-2-2161-JH000	Carbon	2.2kΩ	1/6W	±5%	1
R650	RD1-0-1251-JN000	Carbon	100Ω	1/4W	±5%	1
R651	RD1-0-1251-JN000	Carbon	100Ω	1/4W	±5%	1
R652	RD8-2-1161-JH000	Carbon	820Ω	1/6W	±5%	1
R653	RD2-2-1161-JH000	Carbon	220Ω	1/6W	±5%	1
R654	RD2-2-2161-JH000	Carbon	2.2kΩ	1/6W	±5%	1
R655	RD1-5-2161-JH000	Carbon	1.5kΩ	1/6W	±5%	1

Ref. No.	Part No.	Description				Q'ty
R656	RD1-0-1251-JM000	Carbon	100Ω	1/4W	±5%	1
R657	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R658	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R659	RD1-8-4161-JH000	Carbon	180kΩ	1/6W	±5%	1
R660	RD3-9-4161-JH000	Carbon	390kΩ	1/6W	±5%	1
R661	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R662	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R663	RD6-8-2161-JH000	Carbon	6.8kΩ	1/6W	±5%	1
R664	RD2-7-2161-JH000	Carbon	2.7kΩ	1/6W	±5%	1
R665	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R666	RD1-5-4161-JH000	Carbon	150kΩ	1/6W	±5%	1
R667	RD1-3-4161-JH000	Carbon	130kΩ	1/6W	±5%	1
R668	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R669	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R670	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R671	RD1-0-5161-JH000	Carbon	1MΩ	1/6W	±5%	1
R672	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R673	RD5-6-1161-JH000	Carbon	560Ω	1/6W	±5%	1
R674	RD6-8-2161-JH000	Carbon	6.8kΩ	1/6W	±5%	1
R675	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R676	RD5-6-2161-JH000	Carbon	5.6kΩ	1/6W	±5%	1
R677	RD5-6-2161-JH000	Carbon	5.6kΩ	1/6W	±5%	1
R678	RD3-9-3161-JH000	Carbon	39kΩ	1/6W	±5%	1
R679	RD5-6-2161-JH000	Carbon	5.6kΩ	1/6W	±5%	1
R680	RD1-2-3161-JH000	Carbon	12kΩ	1/6W	±5%	1
R681	RD2-7-3161-JH000	Carbon	27kΩ	1/6W	±5%	1
R682	RD2-2-3161-JH000	Carbon	22kΩ	1/6W	±5%	1
R683	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R684	RD6-8-1161-JH000	Carbon	680Ω	1/6W	±5%	1
R685	RD5-6-3161-JH000	Carbon	56kΩ	1/6W	±5%	1
R686	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R687	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R688	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R689	RD1-8-4161-JH000	Carbon	180kΩ	1/6W	±5%	1
R690	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R691	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R692	RD1-5-4161-JH000	Carbon	150kΩ	1/6W	±5%	1
R693	RD1-5-4161-JH000	Carbon	150kΩ	1/6W	±5%	1
R694	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R695	RD1-5-3161-JH000	Carbon	15kΩ	1/6W	±5%	1
R696	RD1-5-2161-JH000	Carbon	1.5kΩ	1/6W	±5%	1
R697	RD1-0-5161-JH000	Carbon	1MΩ	1/6W	±5%	1
R698	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R699	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R700	RD6-8-2161-JH000	Carbon	6.8kΩ	1/6W	±5%	1
R701	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R702	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R703	RD1-5-4161-JH000	Carbon	150kΩ	1/6W	±5%	1
R704	RD5-6-4161-JH000	Carbon	560kΩ	1/6W	±5%	1
R705	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R706	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R707	RD8-2-2161-JH000	Carbon	8.2kΩ	1/6W	±5%	1
R708	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R709	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R710	RD3-3-2161-JH000	Carbon	3.3kΩ	1/6W	±5%	1
R711	RD2-2-2161-JH000	Carbon	2.2kΩ	1/6W	±5%	1
R712	RD2-2-2161-JH000	Carbon	2.2kΩ	1/6W	±5%	1
R713	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R714	RD4-7-2161-JH000	Carbon	4.7kΩ	1/6W	±5%	1
R715	RD1-2-4161-JH000	Carbon	120kΩ	1/6W	±5%	1
R716	RD1-2-4161-JH000	Carbon	120kΩ	1/6W	±5%	1
R717	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R718	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R719	RD2-2-2161-JH000	Carbon	2.2kΩ	1/6W	±5%	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description				Q'ty
R720	RD1-0-3161-JH000	Carbon	10kΩ	1/6W	±5%	1
R721	RD1-5-3161-JH000	Carbon	15kΩ	1/6W	±5%	1
R722	RD1-0-2161-JH000	Carbon	1kΩ	1/6W	±5%	1
R723	RD1-8-3161-JH000	Carbon	18kΩ	1/6W	±5%	1
R724	RD1-0-2161-JH000	Carbon	1kΩ	1/6W	±5%	1
R725	RD3-3-4161-JH000	Carbon	330kΩ	1/6W	±5%	1
R726	RD1-8-4161-JH000	Carbon	180kΩ	1/6W	±5%	1
R727	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R728	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R729	RD5-6-4161-JH000	Carbon	560kΩ	1/6W	±5%	1
R730	RD5-6-4161-JH000	Carbon	560kΩ	1/6W	±5%	1
R731	RD5-6-3161-JH000	Carbon	56kΩ	1/6W	±5%	1
R732	RD4-7-3161-JH000	Carbon	47kΩ	1/6W	±5%	1
R733	RD1-2-3161-JH000	Carbon	12kΩ	1/6W	±5%	1
R734	RD1-0-2161-JH000	Carbon	1kΩ	1/6W	±5%	1
R735	RH2-2-A501-JH003	Metal	2.2Ω	1/2W	±5%	1
R736	RD1-0-4161-JH000	Carbon	100kΩ	1/6W	±5%	1
R737	RD1-5-4161-JH000	Carbon	150kΩ	1/6W	±5%	1
R738	RD1-5-3161-JH000	Carbon	15kΩ	1/6W	±5%	1
	POWER SWITCH P.C.B. ASSY					
PCB3	141-0-1939-08294	Power Switch P.C.B. Assy				1
	111-2-6220-11100	Wire Wrap Terminal				2
SW901	⚠ 4-2312-05711	Power Switch				1
C901	⚠ 4-2239-70970	Capacitor	0.01μF	400V		1
	DISK INDICATOR P.C.B. ASSY					
PCB4	141-0-1939-08320	Disk Indicator P.C.B. Assy				1
D501	4-2029-72830	LED, SLP 171 D				1
	CONTROL P.C.B. ASSY					
PCB5	141-0-1939-12280	Control P.C.B. Assy				1
	141-2-8559-13500	Spring Ground				4
CN7	4-2359-78950	Connector 6P Assy				1
CN8	4-2359-78951	Connector 8P Assy				1
CN9	4-2359-77979	Connector 10P Assy				1
CN14	4-2359-77978	Connector 3P Assy				1
SW801	4-2312-05801	Key Board Switch				1
SW802	4-2312-05801	Key Board Switch				1
SW803	4-2312-05801	Key Board Switch				1
SW804	4-2312-05801	Key Board Switch				1
SW805	4-2312-05801	Key Board Switch				1
SW806	4-2312-05801	Key Board Switch				1
SW807	4-2312-05801	Key Board Switch				1
SW808	4-2319-77630	Switch Push 1key				1
SW809	4-2319-77630	Switch Push 1key				1
D801	4-2029-73610	LED, SL 1283				1
D802	4-2029-74270	LED, LD 201 MG				1
D803	4-2029-74280	LED, LD 201 VR				1
D804	4-2029-74280	LED, LD 201 VR				1
D805	4-2029-74280	LED, LD 201 VR				1
D806	202-5-2810-44210	Diode, DS 442				1
D807	202-5-2810-44210	Diode, DS 442				1
Q801	4-2039-72090	Transistor, DTA 114 TF				1
Q802	4-2039-72090	Transistor, DTA 114 TF				1
Q803	4-2039-72090	Transistor, DTA 114 TF				1
Q804	4-2039-72090	Transistor, DTA 114 TF				1
Q805	4-2039-72090	Transistor, DTA 114 TF				1
R801	RD1-2-1251-JM000	Carbon	120Ω	1/4W	±5%	1
R802	RD1-8-1251-JM000	Carbon	180Ω	1/4W	±5%	1
R803	RD1-8-1251-JM000	Carbon	180Ω	1/4W	±5%	1
R804	RD1-8-1251-JM000	Carbon	180Ω	1/4W	±5%	1
R805	RD2-2-1251-JM000	Carbon	220Ω	1/4W	±5%	1
R806	RD2-2-1251-JM000	Carbon	220Ω	1/4W	±5%	1
R807	RD2-2-1251-JM000	Carbon	220Ω	1/4W	±5%	1
R808	RD2-2-1251-JM000	Carbon	220Ω	1/4W	±5%	1
R809	RD2-2-1251-JM000	Carbon	220Ω	1/4W	±5%	1
R810	RD2-2-1251-JM000	Carbon	220Ω	1/4W	±5%	1
R811	RD2-2-1251-JM000	Carbon	220Ω	1/4W	±5%	1
R812	RD2-2-1251-JM000	Carbon	220Ω	1/4W	±5%	1
R813	RD2-2-1251-JM000	Carbon	220Ω	1/4W	±5%	1
R814	RD4-7-0251-JM000	Carbon	47Ω	1/4W	±5%	1
R815	RD1-0-1251-JM000	Carbon	100Ω	1/4W	±5%	1
	POWER INDICATOR P.C.B. ASSY					
PCB6	141-0-1939-12350	Power Indicator P.C.B. Assy				1
D881	4-2029-73010	LED, SLF 206B				1

NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

SAFETY INTERLOCK

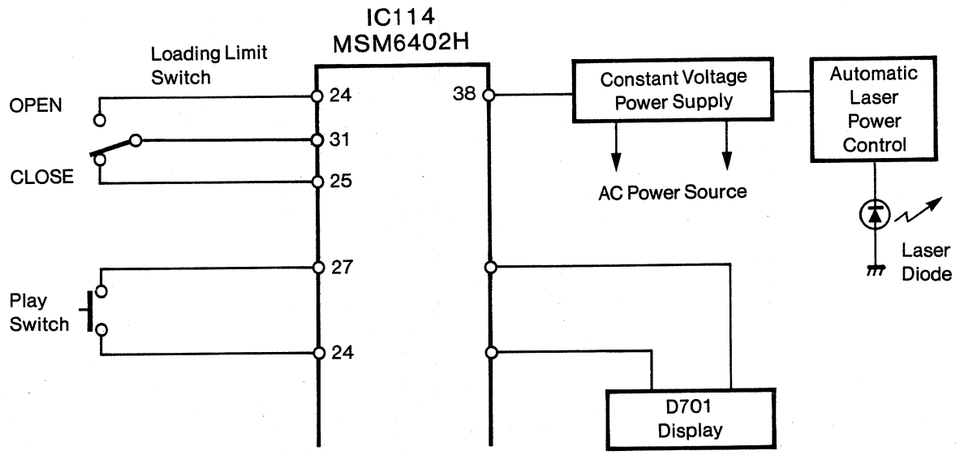
The Digital Compact Disc Player reads the disc signal by detecting the laser beam. It must be avoided for the human body to directly receive the beam. Especialy human eyes are badly affected by the beam. Therefore, the unit is equipped with an interlock to prevent the unnecessary laser outputs.

The laser outputs are controled by the injection or cutoff of the constant voltage source to the laser diode with Pin 38 of IC 114 (MSM6402H). When Pin 38 is in "L" (Low) level, the laser emits the beam. When Pin 38 is in "H" (High) level, the laser does not emit the beam.
Pin 38 is set in "H" level when the unit is loaded with the disc and it reads the index signals or when the unit is set in the play mode after that. When the unit reads the index signals and the following two conditions are met, the laser emits the beam.

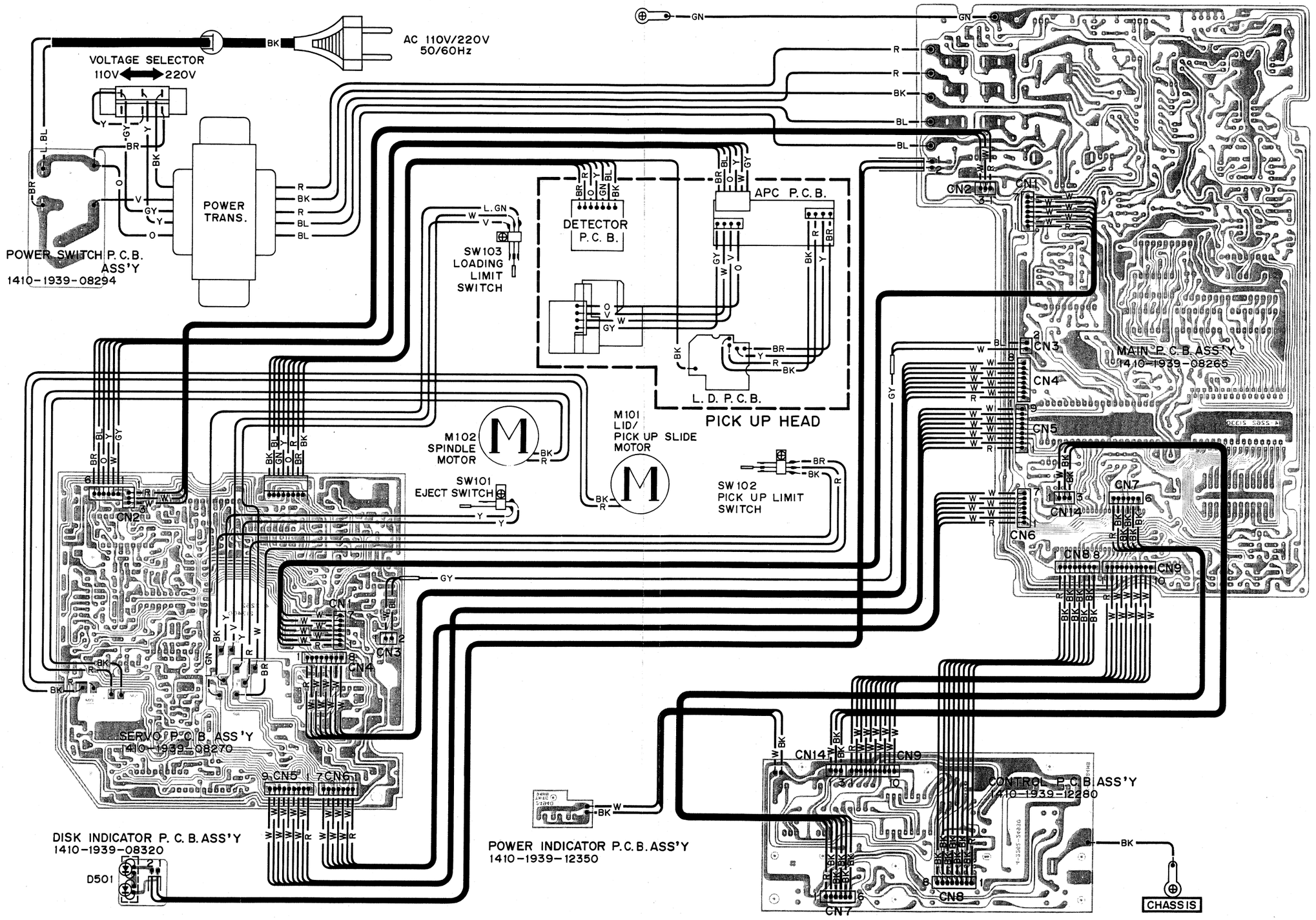
1) When the Loading Limit Switch is set in "CLOSE" side. (The disc tray is closed.)
2) The pickup is located at the area of the minimum internal circumference.

After the above conditions are met and the index signals have been read, the laser emits the beam when the following two conditions are met.

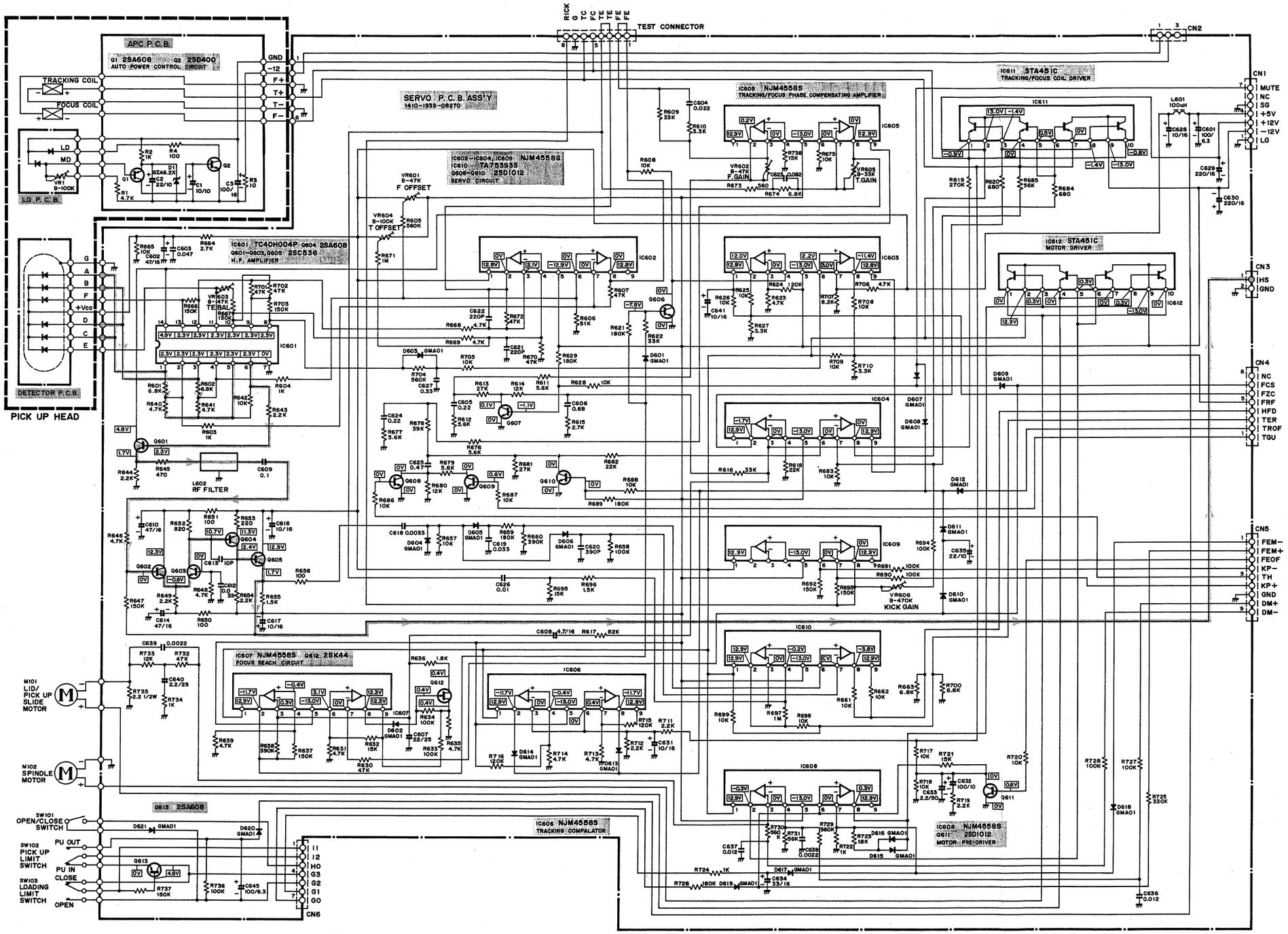
1) When the PLAY button is pressed.
2) When the PLAY indicator is ON.



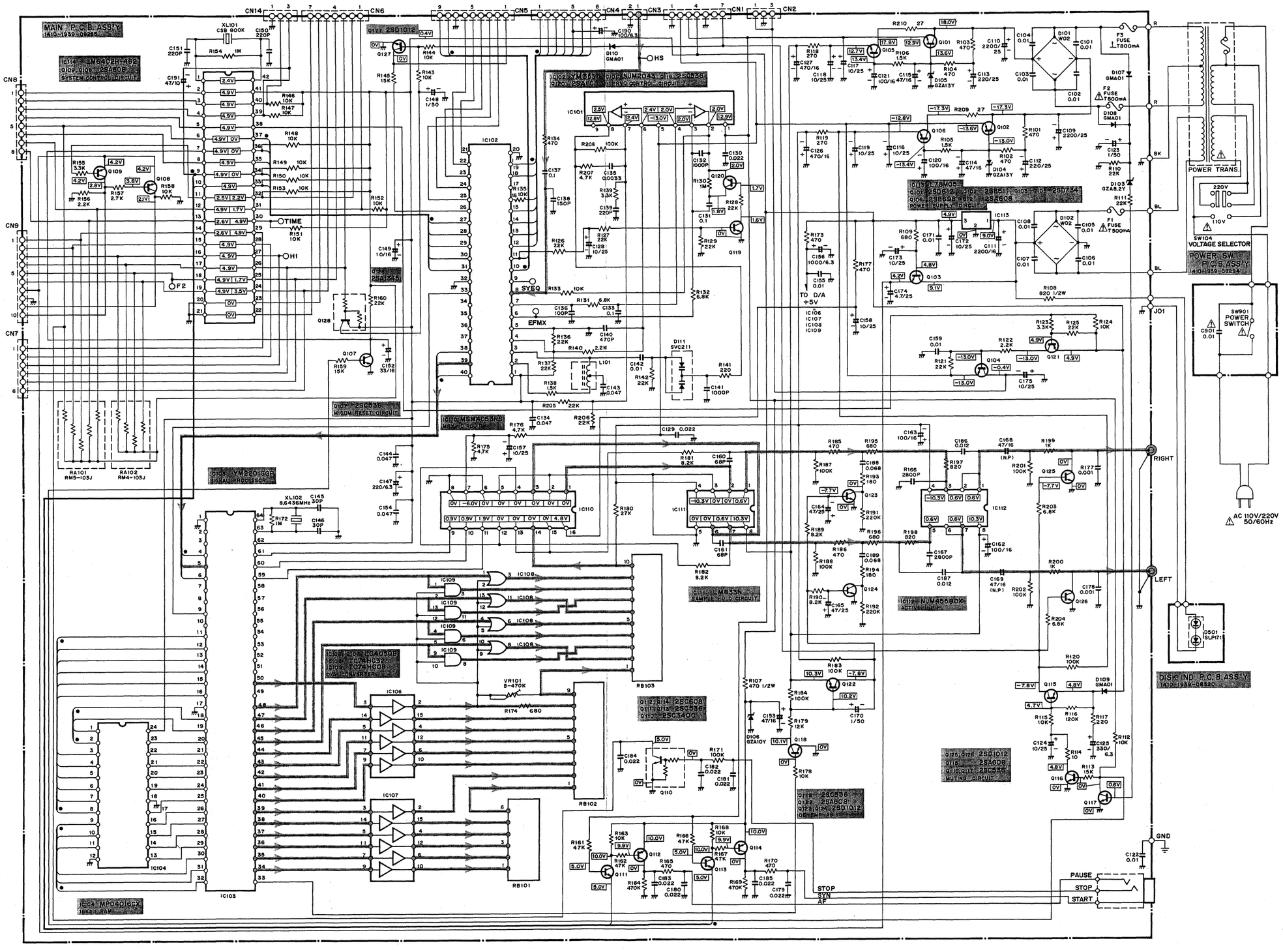
POINT TO POINT WIRING DIAGRAM



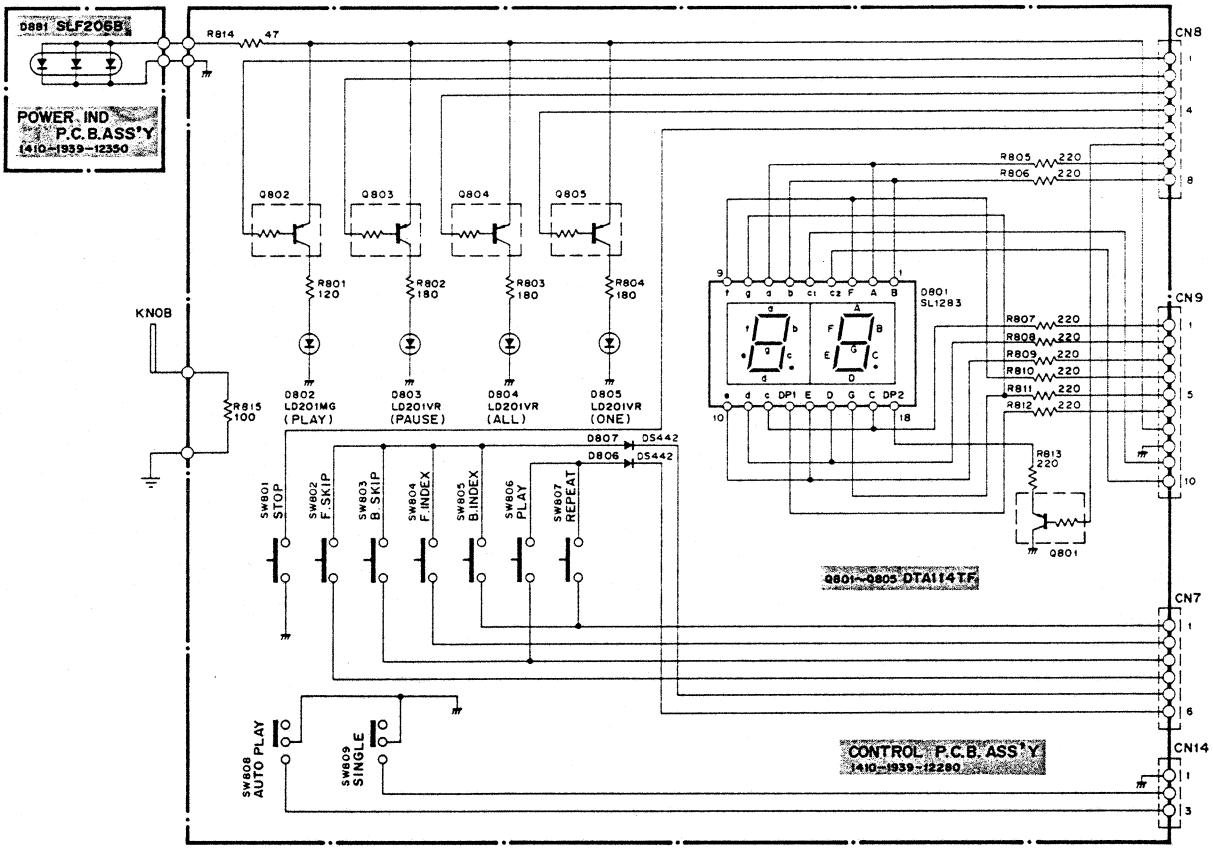
SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM (Continued)



SCHEMATIC DIAGRAM (Continued)



No.	Name	Position
SW101	OPEN/CLOSE Switch	OFF
SW102	PICKUP LIMIT Switch	IN
SW103	LOADING LIMIT Switch	CLOSE
SW104	VOLTAGE SELECT Switch	220V
SW801	STOP Switch	OFF
SW802	F. SKIP Switch	OFF
SW803	B. SKIP Switch	OFF
SW804	F. INDEX Switch	OFF
SW805	B. INDEX Switch	OFF
SW806	PLAY Switch	OFF
SW807	REPEAT Switch	OFF
SW808	AUTO PLAY Switch	OFF
SW809	SINGLE Switch	OFF
SW901	POWER Switch	OFF

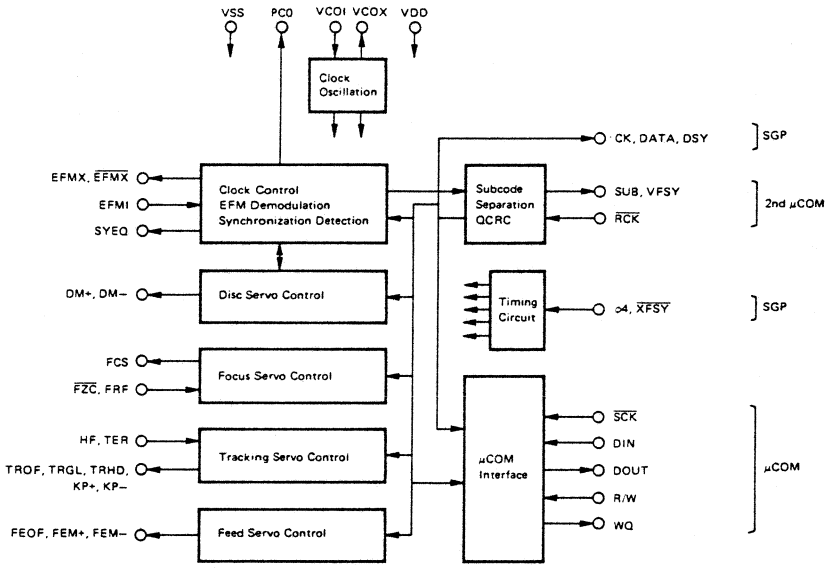
NOTES:

1. All resistors values are indicated in "ohm" ($K=10^3$, $M=10^6$).
2. All capacitors values are indicated in "μF" ($P=10^{-12}$).
3. All voltages indicated on the schematics are measured under the following conditions.
   a. Use a V.T.V.M.
   b. All voltages ±10 % with respect to chassis ground
   c. No signals at input terminals
   d. AC input at 220 volts 50 Hz
4. This is a basic schematic diagram.

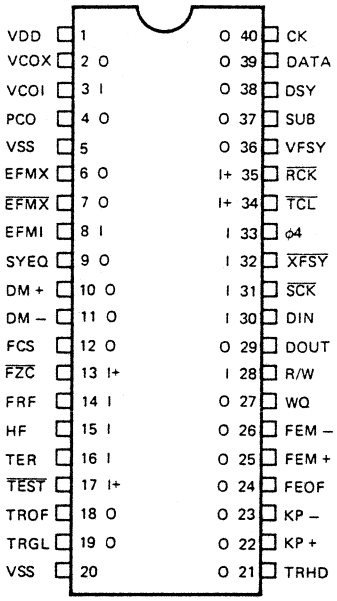
Because Fisher products are subject to continuous improvement, Fisher Corporation reserves the right to make any changes or modifications without notice.

IC SIGNAL FLOW & EQUIVALENT CIRCUIT

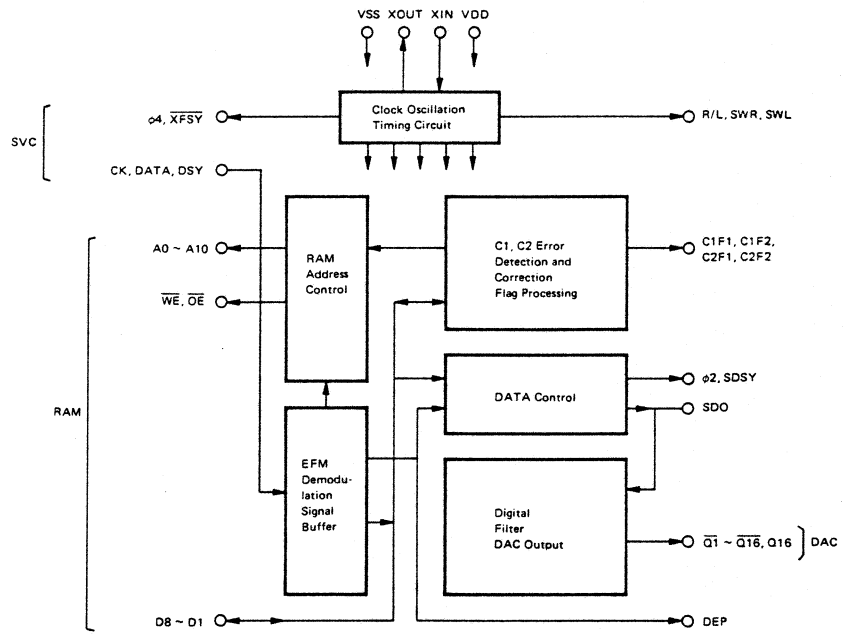
YM 3531



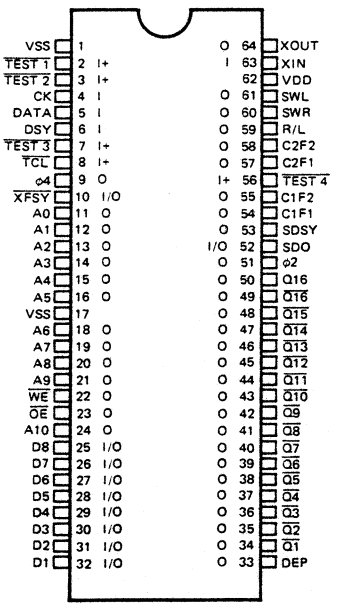
TOP VIEW



YM 2201

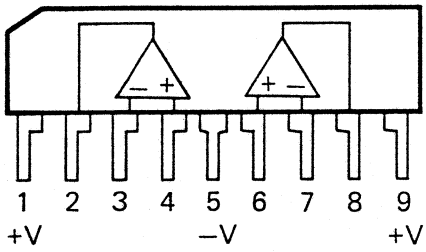


TOP VIEW

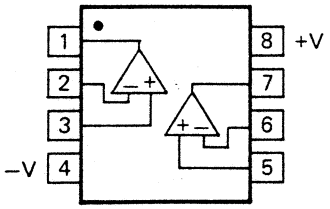


IC SIGNAL FLOW & EQUIVALENT CIRCUIT (Continued)

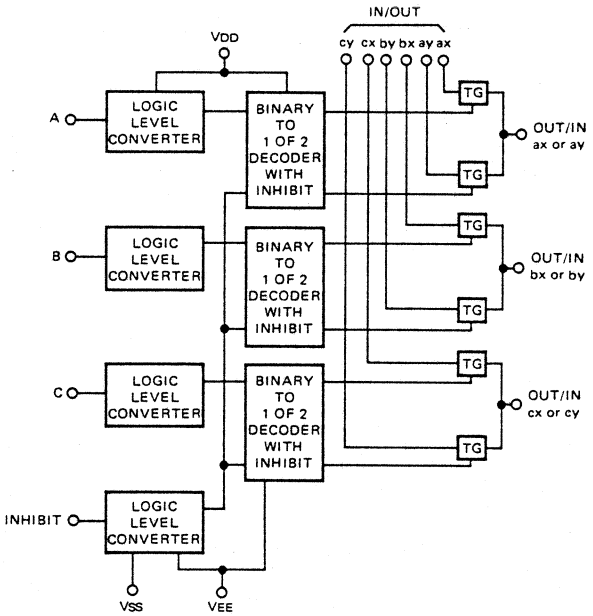
NJM 2043, NJM 4558 S, TA 75393 S



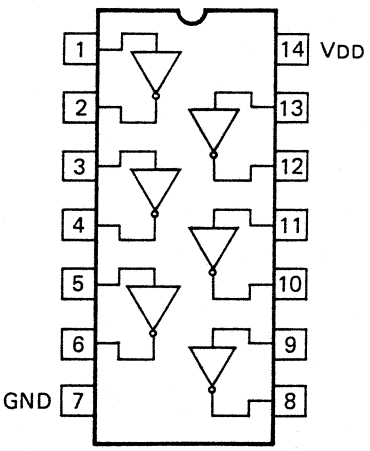
NJM 4558 DX, LM 833 N



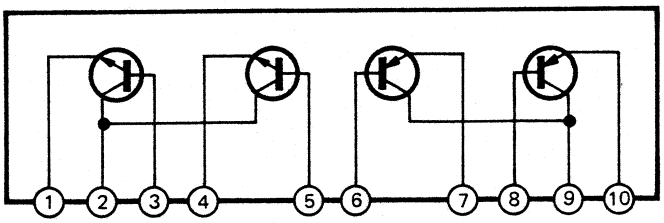
MSM 4053 RS



TC 40H004 P

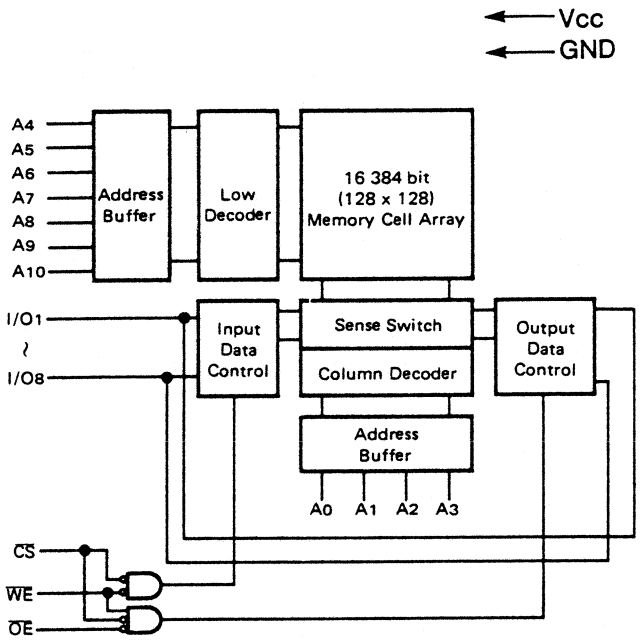


STA 451 C

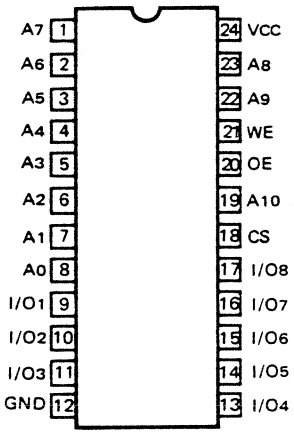


IC SIGNAL FLOW & EQUIVALENT CIRCUIT (Continued)

μPD 4016

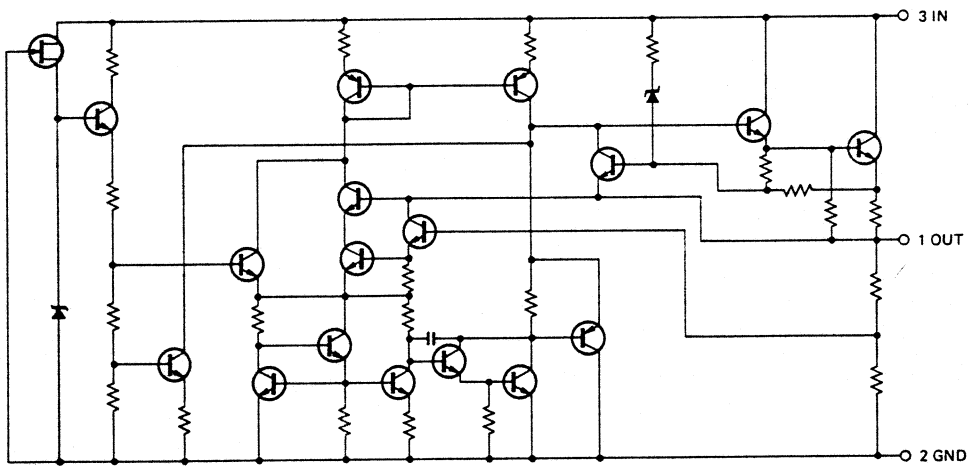


TOP VIEW



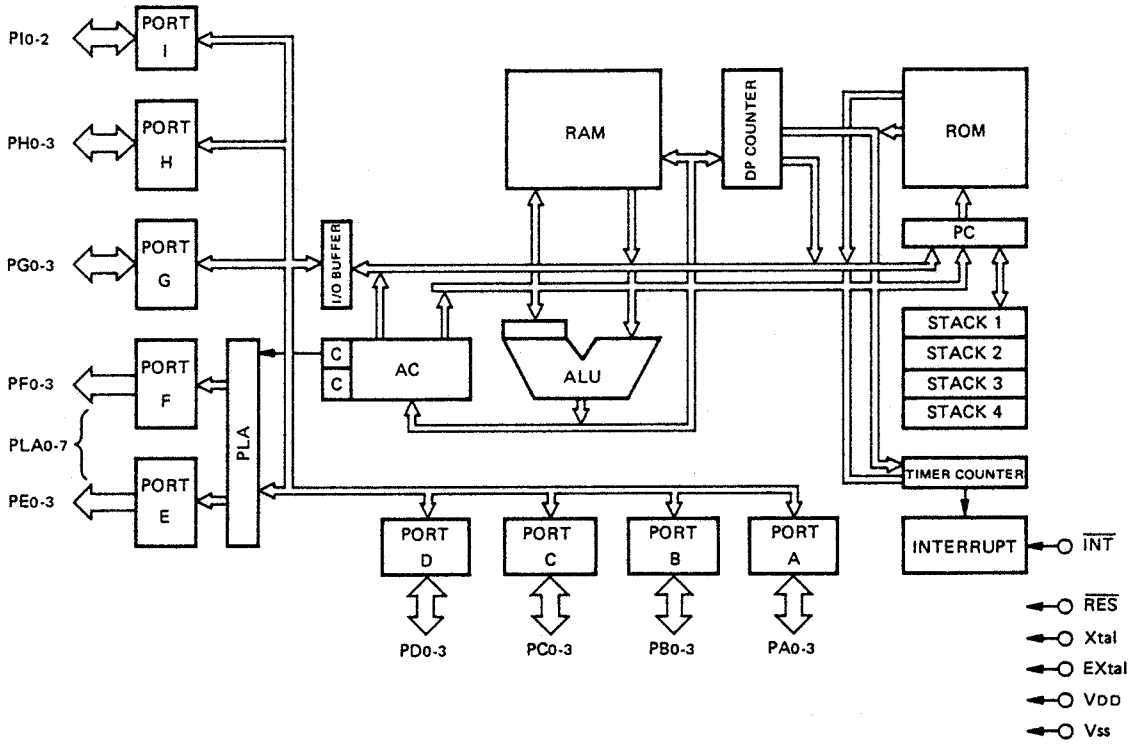
A0 ~ A10	: Address Input
I/O1 ~ I/O8	: Data I/O Chip Select
CS	: Chip Select Input
WE	: Write Enable Input
OE	: Output Enable Input
Vcc	: +5V Power Source
GND	: Ground

L78M05



IC SIGNAL FLOW & EQUIVALENT CIRCUIT (Continued)

LM 6402



MEMO

SERVICE MANUAL

Digital Compact Disc Player

FISHER

AD-M22

EUROPE

137 306 43 (White)
137 306 44 (Red)

This Service Manual is prepared for Model AD-M22 WHITE and RED COLORS. As only the components in the chart below differ, refer to the Service Manual AD-M22 (WM-15423) for other components.
Mark represents a non-interchangeable part.

Ref. No.	AD-M22 (Black)	AD-M22 (White) AD-M22 (Red)	Description	Q'ty	Remark
	PACKAGE				
	131-6-1169-17201	131-6-1169-17203	Box Corrugate Exp	1	#
		131-6-1169-17204	Box Corrugate Exp	1	#
	CABINET				
CA1	141-2-4219-33101	141-2-4219-33100	Screw, Bind Hd. Tapping, +M3.0x8	5	#
CA1		141-2-4219-33101	Screw, Bind Hd. Tapping, +M3.0x8	5	
CA2	131-2-1410-33600	131-2-1410-33601	Cover	1	#
CA2		131-2-1410-33602	Cover	1	#
CA15	131-2-3301-31701	131-2-3301-31703	Chassis Main	1	#
CA15		131-2-3301-31703	Chassis Main	1	#
CA20	131-0-1015-11401	131-0-1015-11402	Escutcheon Dial Assy	1	#
CA20		131-0-1015-11403	Escutcheon Dial Assy	1	#

Add this sheet to Model AD-M22 (WM-15423) Service Manual.

WM-16081

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